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AS001309

FOOT PRINTS

An aid to the detection of crime for the Police and Magistracy

BY

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WITH LITHOGRAPHED PLATES

FIRST EDITION.

1909

CSL 3

CONTENTS.

Page.

CHAPTER I.—Introductory 1

CHAPTER II.—The foot and its features 2

CHAPTER III.—How to distinguish the tracks of the criminal, to make tracings of the track, and to utilise them when made 4

CHAPTER IV.—The characteristics of foot-prints and the reasons for their existence. 8

CHAPTER V.—What can be learned from a series of tracks 10

CHAPTER VI.—On boot tracks 13

CHAPTER VII.—Cattle and miscellaneous tracks... 14

CHAPTER VIII.—Some hints for beginners in practical track reading ... 16

PLATES.—From I to XVIII ... ...

INDEX ... ... i—iv

CSL

PREFATORY NOTE.

The idea of making use of human tracks in criminal work has interested the author in a vague way since 1893, when he had a short spell of duty in Rajputana, and saw *Khojis* at work; but it was not till 1905 when he read General Baden-Powell's book on scouting that he began to think some system might be evolved. A year later the idea of a ruled slate was conceived, but it took a year to get one made. In the meantime the translation of Doctor Hans Gross' "System Der Kriminalistick" by the brothers J. and J. C. Adam came to his assistance, and gave a more scientific turn to his thoughts. He has borrowed ideas from the work, and has ventured to make alterations where he thought mistakes had been made.

Thanks to the interest Mr. C. R. Cleveland, C.I.E., Inspector-General of Police, Central Provinces, took in the work, and for which the author tenders him his grateful acknowledgments, two small classes of Sub-Inspectors have been taught the system. Each of these officers passed a very severe test at the end of a two-month's course of instruction. An ordinary way-farer was stopped, his name and address taken, and he was asked to hide his tracks, by going across ground that did not take impressions, before going on with his occupation. The Sub-Inspector, who of course had not been permitted to see the man, or to have any hint as to who he might be, was then shown the impressions on the road. He took tracings of them, and, after an interval, sometimes running into the third day, produced the person who had made the impression before the Examiner.

G. W. GAYER.

CHAPTER I.

INTRODUCTORY.

Although a human being has not the sense of smell that enables a dog to follow a scent, yet he has eyes that can be trained to identify, and, perhaps follow, a visible human track. It therefore appears surprising that the idea of tracking has not been worked out scientifically, and the police taught to take advantage of the possibilities opened out.

2. It is true that in certain parts of India professional trackers are used to track down criminals; but these trackers are entirely illiterate, and consequently, are unable to improve on the methods handed down from the past; moreover, the people who employ them, being altogether ignorant of the craft, are unable to utilize to the full the powers of the instrument they employ.

3. The writer hopes that the system he is about to set down in the following pages may result in some measure of success in dealing with crime, by rendering available in the interests of public justice the knowledge at present confined to a few illiterate trackers.

4. These professional trackers, who are officially employed to track down criminals, are known in Rajputana as *Khojis* and in Gujarat as *Pagis.*

5. The system on which they are trained is worth notice, not only because it gives an insight into the powers attainable, but also because a police officer who studies the craft will necessarily have to undergo a somewhat similar training. The police officer's training, in the branch which embraces tracking, will, of course, be less rigorous, but more scientific, to enable him to utilize to the full the services of the more highly trained specialist; but that portion of the training which teaches him to make and place on record all the conditions necessary for the identification of a criminal, the impression of whose foot has been found on or near the scene of an offence, must of necessity be most complete.

6. A *Khoji* explained the system of training to the writer thus :—

The *Khoji's* teacher or *guru* gets some person in the village to leave a clear impression of his naked foot on suitable soil, and carefully protects it by placing an inverted box over it; the pupil is then sent for and the characteristics of the foot—or its "chhin"—are explained to him in detail, and he is set to study the foot-mark until he thinks he will be able to distinguish it from others; when he feels confident, he is made to cover it again and told to try and find another impression made by the same foot. When he thinks he has succeeded, he has to confirm his conclusions by referring to the original impression. The conditions are gradually made more difficult until he is able, quickly and certainly, to commit the features to memory, to obliterate the original impression, and some days later, to commence his search for a corresponding impression; he then has to track the maker to his home. It not infrequently takes years of practice before the *guru* is satisfied with his pupil, for the latter must finally be able, not only to track down his quarry, but also to say, after studying the track, whether it is that of a man or woman, whether the person is old or young, fat or lean, burdened or unburdened; whether he or she was running, walking fast, walking ordinarily or loitering, and what he or she was probably doing while moving along.

CHAPTER II.

THE FOOT AND ITS FEATURES.

7. It will first be necessary to give a description of the human foot and explain what the various features are, and as the system may eventually be taught to the subordinate police, it has been thought best to give to the features the names by which they are known to the *Khojis*.

8. To begin with there are five toes: each toe is made up of three phalanges except the hallux which has only two. Under the phalanx at the extremity of each toe is a pad which normally comes in contact with the ground when walking—these pads are called by the *Khojis*—

Anguta	...	that of the hallux (big toe).
Dusri	...	that of the second toe.
Tesri	...	that of the third toe.
Chothi	...	that of the fourth toe.
Chichi	...	that of the little toe.

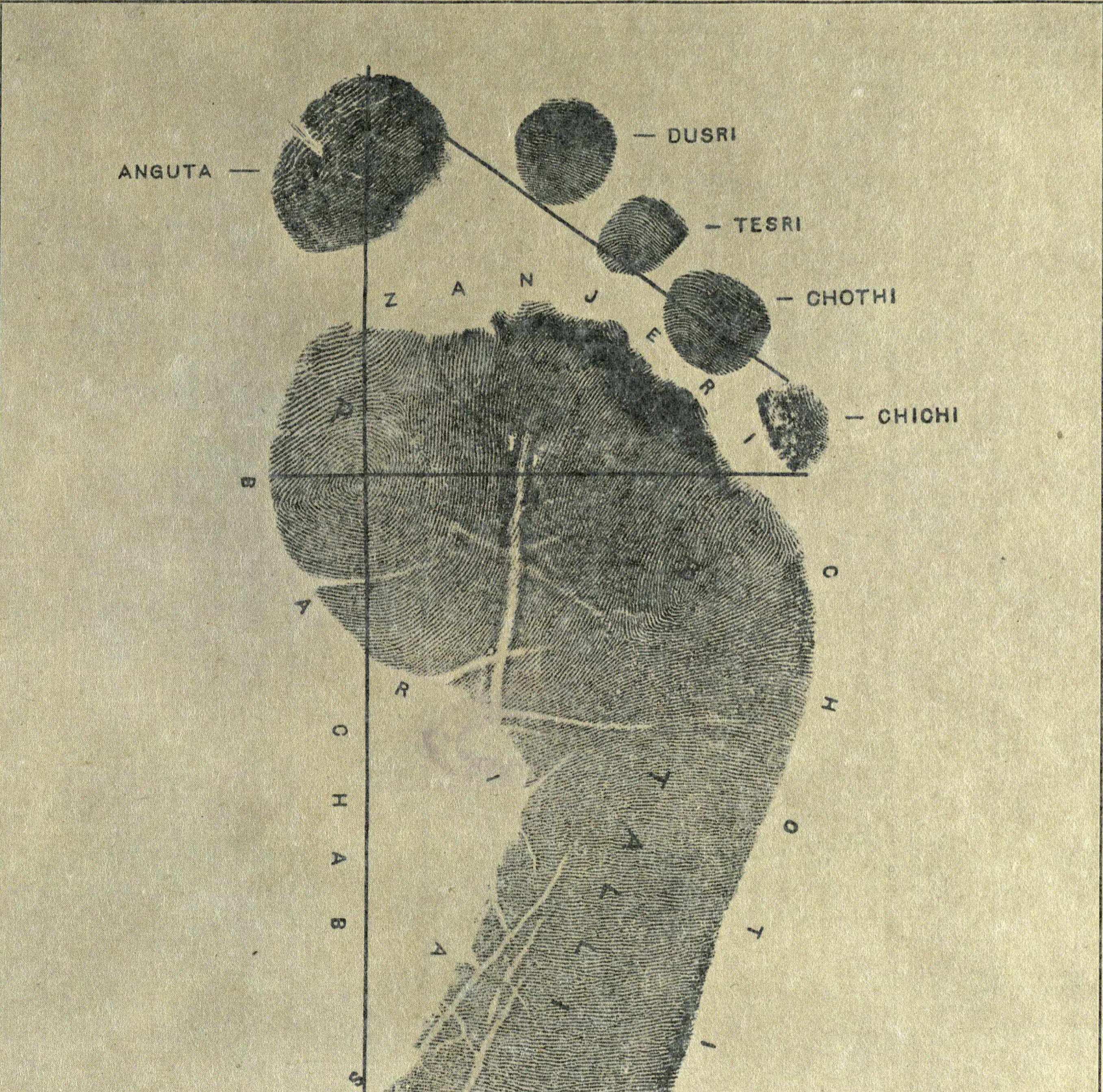
The upper phalanges of each toe are attached to five corresponding metatarsal bones, and the joints are called "metatarso-phalangeal" joints, and the substance which forms the pad below is called the integument of that joint. This pad in *Khoji* language is known as the "pab"; to all appearance it is one long pad reaching right across the foot just behind the toes, but if it be felt by the hand, the bony joint of each separate toe can be distinctly made out.

9. From the metatarso-phalangeal joint, the five metatarsal bones rise to join the five tarsal bones of the ankle joint; from the top of this joint the leg bones—(*tibia* and *fibula*) rise, and from the back of the ankle the heel bone—os calcis—slopes downwards as it projects backwards. Under the arch so formed is that portion of the plantar surface which usually, on its outer side, touches the ground lightly and in the impression forms a connecting bridge—"talli"—between the *pab* and the heel—"eri"—, and, on its inner side, does not touch the ground but leaves a blank space between the *pab* and *eri* known as the "chab". The edges of the impression from the back of the *eri* to the front of the sides of the *pab* are called on the outer edge the "choti assi", and on the inner edge the "bari assi". The front edge of the *pab* just behind the toes is called the "zanjeri".

10. The features then are (*vide* figure 1)—

1. Anguta.
2. Dusri.
3. Tesri.
4. Chothi.
5. Chichi.
6. Zanjeri.
7. Pab.
8. Talli.
9. Chab.
10. Eri.
11. Bari assi.
12. Choti assi.

Every one of these twelve features has as much character as the features of a face, and, once a pupil learns to distinguish them at a glance, he is able to



Half-tone.

FIGURE I.

Survey of India Offices, Calcutta 1909.

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recognize a person from his foot impression as easily as he can from his face. A *Khoji* whom the author employed could, by studying the ground at his master's gate, tell which of the servants had gone in and out that day; for in a few days he was familiar with the characteristics of the feet and the boots of each member of the household.

11. It is obvious that every individual's foot-print must have a distinct individuality, for, even if there were only three common types of each of the features, and we had nothing else to go on, the total possible number of different types would be 531,441, so that, on the average, two feet in about every million would be similar. A careful study of the illustrations and of the text will show that these figures do not err on the side of exaggeration.

12. The features already mentioned are not however all we have to rely on; many feet have creases, cracks and scars, &c., that all show in a clear impression and afford extra evidence for purposes of identification. In the plates at the end of the book a number of such marks will be noticed in the various feet. There is moreover help arising from the fact that the right and left feet are not exactly alike (the difference shows more in the creases, cracks, &c., than in the actual features); and still further assistance is obtainable from the length and breadth of foot, the length of stride, the line of march, and the angle of the foot to that line.

13. The unprofessional eye cannot easily distinguish the features of an impression unless there is a fixed base line and a perpendicular to guide it. The true axis of the foot makes the most convenient base line, and this axis is marked by a line which passes through the centres of both the *anguta* and the *eri*. This base line should therefore whenever possible be taken, in imperfect impressions it may not always be possible. On this line a perpendicular has to be dropped, perhaps the best is the one which just touches the lowest edge of the *chichi* (*vide* figure 1).

14. It is a further help to the eye if the impression when drawn is shown on sectional paper; this paper having heavy lines to delineate the inches, and faint lines the fractions of an inch, shows up the characteristics with very marked distinctness.

15. At the end of the book will be found a series of fourteen plates containing illustrations of foot-prints; these are intended to show how the different features vary in individuals. The persons who made these foot-prints were required to stand on a metal slab covered lightly with printer's ink, and then to step on to tracing paper stretched on a flat board; the print was subsequently pasted on to sectional paper so that the base lines fell on to one of the deep inch lines, and the perpendicular on to another. In taking foot-prints it is advisable to follow some such plan as this, for any measurements that may be required can then be seen at a glance.

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CHAPTER III.

HOW TO DISTINGUISH THE TRACKS OF THE CRIMINAL, TO MAKE TRACINGS OF THE TRACKS, AND TO UTILIZE THEM WHEN MADE.

16. For police purposes the first problem requiring solution is that of the identification of a track as one made by the criminal who committed the offence under investigation. This can in many cases be done by an experienced officer who takes an intelligent interest in the matter and uses his common sense.

17. A criminal who lays himself out to commit a crime, which he has already planned, very seldom behaves just as an innocent person does. To begin with he likes to work in the dark, he does not care to approach his goal by the usual avenues and he prefers to leave by some unusual path. It is advisable for the investigating officer to run over the facts of the case, to put himself in the position of the criminal, and to think what he is likely to have done, the way he has probably come, the way by which he is likely to have departed, the spots he is likely to have stood near and so on. These places should be examined for traces. He will probably have come and gone by unfrequented ways, over a field, through a garden, through a hedge, over a wall or perhaps along a wall or roof. Again instead of walking boldly and naturally to the door, he will have approached cautiously taking short uneven steps and stopping frequently to listen and peer through the gloom; he will have stood near corners to peep round them; he may have squatted, or darted to some hiding place, he may have walked backwards to get out of a position from which he could be seen; he may have stood at a door or window and peeped in through a crack; he may have come fairly close in boots, have taken them off and approached bare-footed, and again picked up his boots on going away; he may have been alarmed and had to run; he may have come unburdened and have gone away heavily laden; he may have gained access by getting on to a wall, by climbing up a tree or on to something else; he may have jumped from a window or wall or roof. Some of these are things which are quite likely to have happened in any case under investigation, and—provided the soil takes a clear enough impression and the indications are read correctly—they will show with fair certainty which is the track of the criminal. In some cases much more certain indications will be got, for instance suppose a house has been broken into and the burglar has dropped stolen articles on his line of retreat, any impression, provided it is not made by a person who has since followed the track of the burglar, found on this line which corresponds with one near the scene of the house-breaking will indicate that the impression is that of the criminal. In most cases of theft in which the property stolen has been contained in a box, and the box has been carried off, it will have been broken open some way off; in many cases in which more criminals than one have been at work the property will have been inspected, and perhaps divided, some way off. Frequently, when articles have been hurriedly carried off, the thief will have made a halt at some convenient spot to throw aside useless rubbish and to pack up the rest conveniently for conveyance. In all such cases tracks found near the places where the criminal has undoubtedly been, similar to suspicious ones near the scene of the offence, will show pretty clearly that the tracker is on the right scent. Again if there has been a struggle and the offender has been injured and blood drawn it will show on his track, or, if he has been lamed, a limping track will also point to the impression being the one sought for.

18. It is not therefore so hard as one would imagine—once one has studied human tracks and learnt how to interpret them—to decide which is the track of the criminal; all that is required is sound common sense, keen observation and a determination to make no mistakes, and in numerous cases the track of the criminal will stand out clearly marked.

19. Having decided which are the criminal's tracks, the next step is to get a record of an impression left by one or both of his feet. Many of the im-

CSL

pressions which will help a tracker to decide that he is on the criminal's track will be quite useless to him when he wants to make drawings of them, for the great majority he comes across will be incomplete and partially obliterated. He must then look out for an impression which will suit his purposes; let him track* the criminal to some place where the soil has taken a clear impression, such as a dusty path, a hard clean sandy surface or the like.

20. The *Khoji* by much application and long practice is able quickly to perceive all the characteristics of a foot impression and to retain them in his memory; no investigating officer could spare the time for such a lengthy course of study, but there seems no reason why—once he has made up his mind that an impression before him has been made by a person who has committed an offence—he should not by some mechanical means produce a permanent record of all its characteristics and make use of it in his work. Such a record made at the commencement of an investigation might not only lead to the detection of the criminal, but might also form valuable evidence at his trial.

21. To facilitate the making of reliable records of such impressions the author has devised a transparent slate made of plate glass etched off into sections exactly like ⅛th inch sectional paper, the inch lines being enamelled red to show them up clearly and the fractional lines uncoloured. The copper plate from which these are etched, which has been made by the firm of Messrs F. and C, Osler, Limited, belongs to Government, but the glass slates can be obtained from the above mentioned firm with the sanction of the Inspector-General of Police, Central Provinces and Berar. These slates—if set in thin frames with low legs at the four corners, so arranged as to raise the under face of the glass about half an inch above the surface of the ground—allow a sufficiently clear view of an impression on the ground to be obtained to permit of an accurate drawing being made.

22. The glass slate should be so placed that one of the enamelled lines covers the base line, and another the perpendicular. The fractional lines are a great help in guiding the eye to the true centres of the *anguta* and *eri*, *i. e.*, say the *anguta* is one and a quarter inches wide, it will only be necessary to get the fifth line on either side of the enamelled line (the one that covers the base line) directly over each edge of the *anguta*; and the same principle applies to the *eri*; with a little practice this can be done very quickly.

23. The sketching in of the profile of the foot is best done with a water colour brush (No. 5 is a convenient size) and some dark water colour. Great care has to be taken to have the eye *directly over*† that portion of the impression that is being painted, otherwise refraction comes in and an inaccurate impression is made. The only difficulty is to watch the point of the brush, whilst the eye is on the impression. The following plan has been found satisfactory for a right handed man:—Let him keep his eye on the edge of the impression he is painting and place the brush in a sloping position, point inclined to the left, on the slate, and move it along so that the left edge of the line he makes runs directly over the edge of the impression he is tracing. When this method is adopted it will not matter how broad the line is made, for only the left edge of it will have to be taken into account.

24. A plain piece of glass can be used instead of a glass slate and it has the one advantage of permitting the impression to be more clearly seen, but the advantage of the sectional lines is lost; if a sheet of plain glass be used two lines should be first painted on it to represent the base line and perpendicular, and it is as well to paint these two lines on the under face of the glass so that they will not interfere with the sketch.

25. Lines painted with water-colour can be easily washed off with water.

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*Hints on tracking will be found in Chapter VIII.

† It is not a bad plan to occasionally check oneself by holding the brush upright over the spot being painted and looking down it.

CSL

26. Having sketched in the whole profile the next thing is to paint in all creases, cracks, &c., and this should be done with all the accuracy possible, once again taking care to have the eye directly over the crease that is being traced.

27. When the copy is complete the slate should be placed in a vertical position and the painting traced off on to tracing paper, which can subsequently be pasted on to sectional paper. This, tracing, having been signed by two respectable witnesses, who should have been present throughout the operation, and by the drawer can then be sent into the head-quarters office so that no question of the *bonâ fides* of the investigating officer can subsequently be raised.

28. The slate remains with the officer to help him in his investigation, and now the question is, what use can he make of it? He has not learned to track, and even if he had, he has a great deal of other work to do; quite true, but why should he not have a tracker? All *Khojis* probably belong to the regular hunting tribes and the art of tracking is bred in their bones. In these Provinces are many jungle tribes, the members of which are born trackers, and almost any man from among them could easily be taught to follow a human track. If some of them were enlisted and their recruit's training supplemented by a course of instruction in following human tracks, there seems no reason why they should prove failures. They could be easily taught from the illustrations in this book what the characteristics of a foot-print are, and if a small reward were given for each case traced by them, they would take a keen interest in the new kind of shikar. The tracker constable would have to work in plain clothes and take care that he was not recognized as a constable. If he succeeded in tracking his quarry down to a certain village, he could then send word to the investigating officer, and until he arrived, could work in the village and try to mark the house from which the criminal came. It is usually in cases of house-breaking that the non-success of the police is most apparent, and it is just in such cases that opportunities of tracking are most likely to be obtained. If the tracker is clever enough not to raise suspicion by his movements, he ought by loitering about the houses of known "badmashes" to spot a fresh track near the house of one of them. On his arrival the investigating officer would have his slate to enable him to check his tracker's work, and a quick search might perhaps enable him to recover some of the stolen property.

29. The immediate objective of the tracker is to detect the thief. Ordinarily when the thief is known the charge can be proved by production of the stolen property or other evidence, but occasionally the tracks themselves may be most useful as a piece of damning evidence. In either case it is necessary for the police officer and the tracker to form an opinion whether various tracks are those of one person or not, and in the latter case it is necessary for the Court trying the case to form an opinion whether the tracks found at or near the scene of occurrence, as recorded at the time in the tracing made by the police officer, are the same as the tracks of the man under trial for the offence. In comparing tracks the following hints will be found useful.

30. When two impressions are being compared with each other with the object of finding out if both have been made by the same foot, one thing must be clearly understood, if they are impressions of the same foot they will *agree in all essential points and there will be no points of disagreement.* If there are points of disagreement, and these have not obviously been caused by some peculiarity or irregularity of the ground, or by some accident, it should be at once admitted that the impressions are those of different feet. If the soil is soft and the walk is energetic the probabilities are that the impression will appear slightly shorter (as well as broader) than the foot which made it, because the heel, after having dug in deep, will rise while the toes dig in deep and the sole will present, as it were, a concave surface to the soil. A reference to the following chapter will make it clear that the impression caused by the foot of a man standing can never look just like that of a man walking, and this is an important point to remember when the foot-print of a criminal walking towards or away from the scene of his crime has been found; if he is subsequently traced, and it is wished to compare his

CSL

foot-print with that found on the scene, he must be made to walk *unconsciously* in much the same manner, over much the same kind of ground, which must be in the same condition; the word *unconsciously* is specially emphasized as a man can materially change the look of his track if he is thinking of what he is doing.

31. It will of course be obvious to any one who reads this book that it is quite useless to try and identify a track as the impression of any particular person's foot by measuring that *foot*. The only practical way is to compare the *impression* supposed to have been made by him with one known to have been so made.

32. It seems hardly necessary to produce arguments to demonstrate the desirability of the police being acquainted with the art of tracking, except in reply to the possible objection that all traces will have been obliterated before the police arrive on the scene. There is however no reason why traces should be obliterated. In parts of India where *Khojis* are employed the scene of an offence is carefully left untouched until the arrival of the police and *Khoji*, and it is probable that, if villagers find that by leaving the spot untrampled there is greater chance of their lost property being recovered, and if village policemen have it constantly dinned into them that they should teach their villagers not to obliterate tracks, surely it will only be a matter of time before they see the advantage of helping the police. A good station-house officer could do a lot in the way of educating his village police authorities, and success would be assured if Government would insert in the Village Headmen's rules a recommendation that they should endeavour to keep people off the scene of an offence in criminal cases until the police have had an opportunity of inspecting it.

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CHAPTER IV.

THE CHARACTERISTICS OF FOOT-PRINTS AND THE REASONS FOR THEIR EXISTENCE.

33. So far we have considered merely the application of tracking to police work, and hardly touched on the art of tracking. As, however, it is essential for a police officer to know something of the science if he is to make the best use of the professional tracker, this and the following chapters are devoted to the science of tracks.

34. The first thing is to consider how an impression is made. Most people walk with their toes more or less turned out, and when this happens the knee is turned out slightly also. Let us consider a man walking *unconsciously* with his toes turned out—stress is laid on *unconsciously*, for a person who is thinking about his style of walking is almost certain to do things out of the common—he is standing, let us suppose, in the most natural position (that is with his feet apart) facing the direction in which he intends to walk: the pressure on both feet is equal, they are both resting flat on the ground at right angles to the axis of the legs. A perpendicular dropped from the centre of gravity will then fall on a spot equidistant from both feet and between them. He is about to move forward, his first action is to sway his body forward so as to throw the centre of gravity in the direction he is about to proceed in; as he does so he flexes the joints of the leg he is about to push forward—we will say it is the left. The fact of bending the knee causes the angle of the foot to the leg to become rather acuter than a right angle and raises the heel from the ground. With the movement of the leg forward the rest of the foot gradually leaves its bed, the toe being the last to sever its connection. All this time more and more weight has been thrown on to the right foot, until at last it bears the whole weight of the body, and the body is moving forward over it and the centre of gravity hangs over the line of support and advance.

35. The left leg is advanced, all the joints being flexed; the centre of gravity is also thrown forward, and when it has advanced so far that equilibrium is likely to be lost the left leg straightens out and the left heel comes to the ground. In the meantime the right leg has become flexed at the knee, the angle of the foot to the leg has become more and more acute, until the right heel has been forced to leave the ground, so that the weight of the body now rests on the forepart of the right foot and on the back of the left heel. This change of support causes the centre of gravity to swing towards the left from the right, it has also—as we have seen—been moving in the forward direction. This swing to the left and front is given an impetus in that direction by the right foot also which is now pushing along that line.

36. When the left heel is brought to the ground, as the toe is turned out and as the impetus is towards the left front, it is the outer side of the back of the heel that strikes the ground, and it cuts into the ground in both a downward and forward direction, so that the impression left is not a vertical cut but one that slopes forward as it sinks into the ground. Naturally some soil is displaced and is pushed forward and upwards forming a little heap under the left heel There is of course no pause in the movement: the left sole is gradually brought to the ground and the little heap below the heel is pressed down and forward as the rest of the left foot comes to the ground.

37. All this time the right foot is being gradually raised from the ground and the weight of the body is being shifted from it to the left foot: when it is raised so that only the *pab* and toes rest on the ground, it, as already mentioned, takes to pushing forward, the left coming flat on the ground, and the impetus causing the left knee to bend slightly. That knee, as we have seen, is also turned outwards like the toes. The whole movement then is outwards and forwards, and if the soil under the left foot were sufficiently slippery the foot would slide in that direction (just as it does in rinking or skating); in many kinds of light or greasy soil there is a certain amount of movement in this direction,

CSL

but as a rule the resistance set up by the soil is sufficient to hold the foot practically in the exact spot in which it was planted.

38. Before the right toe leaves the ground it gives a final push towards the left foot and the toe is dug into the ground to get the necessary purchase. This push develops into a sort of kick to the right rear, *i. e.*, away from the left foot. The moment when the kick is given is the moment when the movement of the left foot to the left front is greatest and culminates : after that as the right foot is swung forward the pressure on the outside front edge (*choti assi*) of the left foot is relaxed and shifts to the ball of the left foot—(that portion of the *pab* behind the *hallux*), the centre of gravity begins to swing to the right, and the left foot takes up its duty of pushing the body in a forward direction with a tendency to the right. These changes cause a sort of circular or twisting movement in the *pab* of the left foot ; first it has pushed the soil towards the left front, then it has pressed it straight down as the pressure has passed directly above it and lastly it has pushed the soil to the left rear as the left foot takes off for the next step ; this roll of the foot from the outside to the inside makes the breadth of the impression of the *pab* greater than the *pab* which actually produced it, but the difference is seldom noticeable except as a kind of double edge to the *choti assi*.

39. While the right foot is being swung forward the left heel leaves the ground followed almost immediately by the fall of the right heel to the ground ; this relieves the left foot of some of its burden, and this burden diminishes as the body moves forward leaving the foot free for the task of giving the final push or kick forward necessary to swing the body on for the next step : the freedom for this duty is greatest just before the toes leave the ground, and all the time the pressure on the soil has passed further and further to the front until nothing but the toe is left on the ground and that gives the final push, having pressed its way well into the earth, throwing back the soil towards the *pab* as it does so.

40. We have now followed in detail the movements that take place in the left foot, also those in the right to the point where the heel strikes the ground. The forces exerted on the ground by the right are similar to those exerted by the left, only where the word "left" is used "right" must be understood and where "right" is used "left" must be understood. The practical results seen in the impression are :—

(*a*) That the most marked impressions are those made by the back of the heel on its outer side, and by the toe on its inner side (this is so much so that a booted foot on certain hard soils leaves no other easily discernible marks).

(*b*) That there is a small heap of soil thrown up by the back edge of the heel and pressed down by the flat of the heel.

(*c*) That there is some soil thrown back by the toe of the foot and this soil is loose and not pressed down (NOTE.—A person walking bare-foot pushes back soil also with the *pab*, specially the portion immediately behind the *hallux*).

(*d*) Next to the heel and toe the portions of the impressions most deeply marked are those formed by the outer edge (*choti assi*) just behind the little toe, and by the *pab* just behind the hallux.

(*e*) Under the *pab* there is displacement of soil from the back forwards as it is pushed towards the front of the outer edge ; then from the front as it is pushed backward and away from the central line of march ; in soils that show this, an impression with a "screwed" appearance is visible.

(*f*) The *pab* is broader (though seldom appreciably) in the impression than the *pab* of the sole which made it.

41. The whole of the foregoing, bear in mind, is only in the case of a man turning his toes out and walking naturally on the level.

CHAPTER V.

WHAT CAN BE LEARNED FROM A SERIES OF TRACKS.

42. In the last chapter we have only studied a single impression and considered the action of the foot on the ground with a view to ascertaining what forces are exerted on the soil and the results that follow. Let us consider a series of tracks, those of a person walking *straight* along a level road.

43. Let us take a piece of string and stretch it along the line of march, so that it follows the centre of it; it will be found that there are four possible positions of the heels relative to the centre line:—

(1) that the right heel falls a little to the right, and the left heel a little to the left, of the string;

(2) that both heels touch the string but the right lies to the right, and the left to the left of it;

(3) that the string passes over both heels;

(4) that the right heel falls on the left, and the left heel on the right, of the string, *i. e.,* the tracks cross each other.

44. Of these the third is the usual phenomenon, for the ordinary man in good health (until old age begins to tell) if he walks with his toes turned out and with fair energy generally walks with his heels well on the central line.

45. Nos. 1 and 2 usually occur when the walk is slower, when the walker requires greater security of balance, or when there is some physical obstacle such as bulky anklets. We may expect to find the feet planted well apart in the case of old people, fat people, *enciente* women, people who have some malady which makes walking difficult, also with people carrying burdens and walking slowly.

46. No. 4 occurs when people are drunk, tired, sick, wounded, affected in the brain, and sometimes in the case of loiterers.

47. With people in health, *walking straight*, whether their heels lie apart or not, the line joining the right heels, and the line joining the left heels, are straight; if they are not straight—*i. e.* if they zigzag—the person is not in sound health; he may have some brain trouble, be a paralytic, be drunk, giddy, weak, ill or wounded.

48. There is another important indication to be got from the line of march, *i. e.*, the angle the impressions form to the straight line shown by the string. People, when walking unconsciously, seldom change the angle at which they turn out (or in) their toes, so the angle of the foot is a point not to be neglected.

A man is believed to get the greatest results out of his efforts if—

(1) he walks with his feet straight, and

(2) his line of march is directly along the central line of his feet.

The further his heels are planted apart laterally, the more ground he loses at each stride; and the more he turns his feet out the less advantage he gains from the length of them. Nature teaches us this, and we find the greater hurry a man is in, the straighter will he walk, and the straighter will he plant his feet.

49. Rustics who are generally honest workers and are much on the move usually walk with straight feet; another thing which operates to make the rustic in India keep his feet straight is the habit he has of following narrow paths in the jungle and elsewhere; under such circumstances turning out the toes means bringing them in contact with things projecting on to the path. People with injured feet, or wearing boots that hurt, will turn the affected foot so as to save the tender spot as much as possible.

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50. When a person walks with his toes turned in, the inner side, instead of the outer side, of the back of the heel strikes the ground first, and the push given to the soil by the toe will be straight from the front rather than from the inner front edge ; this is seen more clearly in the booted foot.

51. Knock-kneed people walk with their heels apart—as in paragraph 43 (1)—and in their case too, the inner part of the back of the heel strikes the ground, but the feet are quite as likely to be turned out as they are in the case of straight legged people.

52. Women who wear bulky anklets as a rule walk with their feet straight, or even slightly turned in, and heels apart so as to keep the anklets from striking each other.

53. Those that wear big ornaments on their toes keep their toes in the air till the foot is flat and then drop them gingerly on to the ground ; in this case the kick off is mainly given by the *pab* and the impression made by the toes is lighter than usual.

54. *Enceinte* women and fat people generally turn their toes out a good deal.

55. People walking on tip-toe keep their feet pointing straight to the front or turn them in, and select spots on which to put them down, the greatest pressure in these cases is on the front of the *pab* and on the toes.

56. In walking up a slope, the heel strikes in less and less deeply as the ascent gets steeper and steeper, because the leg instead of being straight when the foot is brought to the ground is bent at the knee ; in walking up-hill, persons who habitually turn their toes out proceed with them straighter than usual.

57. In walking down a slope the feet are usually kept straighter if not quite straight : the foot is brought more flatly to the ground because it is bent at an obtuse angle to the leg, and the rear leg is much flexed at the knee ; the result is that the back of the heel and the toe strike less deeply than when walking on the level.

58. In walking fast the length of the stride is increased and both the heel and toe strike more deeply and sharply into the ground, the feet too are generally kept straighter than when walking slowly.

59. In carrying a weight the step is shortened, and the impression is deeper, specially that of the toe, but the heel cut is frequently not so deep or sharp, and has not the same forward thrust as that made by a vigorous man striding along quickly, as the knee is slightly flexed to prevent the jar which is increased when burdened.

60. We have already seen there is much to learn from an attentive study of tracks, but there is another indication to help ; so far we have only looked at the track and line of march, let us now go on another stage and measure the length of stride (that is from back of heel to back of heel) for a series of consecutive steps. If the man has been walking unconsciously at an even space along a level road without obstacles on it, then theoretically the distance from heel to heel ought not to vary ; but they do vary more often than is thought. Generally speaking all the steps taken with the right leg are practically of the same length, and all those taken with the left leg are much of the same length, but those taken with the right leg do not always measure the same length as those taken with the left leg, even though there is no apparent reason for a difference. This possibly may explain why persons who lose themselves in open plains—specially in the dark—so often walk round and round in circles.

61. Frequently a difference in the length of steps is explained by some such thing as a wound, injury or malformation which causes a species of limp in such cases the affected leg takes the shorter step, the sound leg doing the

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lion's share of the work; and the shorter step is frequently uneven in length, sometimes being longer than at other times.

62. A tall person usually takes a longer stride than a short person.

63. After middle age the older one grows the shorter one's steps are likely to become.

64. A person avoiding an obstacle either lengthens or shortens his pace, or places his foot off its line of march according to circumstances.

65. A person who is weary, infirm, aged or awkward will often brush the surface dust with his foot as he moves it over the ground; when this brushing is done by *one foot only* it means a wound or malformation, or some trouble like paralysis.

66. Occasionally it will be found that a man has tried to disguise his track, for instance he may have walked backwards: in that case, the steps would be short and irregular; the earth displaced by the toes would sometimes have been thrown up both in front and behind as the toes were pressed into the soil, and any portion of it which came under the sole would have been trodden down. The soil thrown up by the heel would *not have been trampled down* and the cut made by the heel would not have looked clean like that of a person walking forwards.

67. Or he may have tied on shoes with the heels in front so as to deceive, in such a case any earth thrown up by the reversed *toe* would be trodden down, and any thrown up by the reversed *heel* would not be pressed down; also very often the mark of the string used to tie on the shoe would be visible.

68. So far we have only had in mind a person walking, let us now consider one running. In all running the toe mark is highly developed because the push or kick has to be sufficiently strong to throw the whole body into the air, both feet being off the ground at the same time (a thing that never occurs in walking).

69. Men when running slowly, usually run on the soles of the feet and not on the heels (as in doubling), and then the thrust back from the toe is considerable and the heel mark scarcely shows at all.

70. In running fast the heel comes to the ground in the same way as in walking only with the increased force.

71. No attempt has been made to differentiate between the booted and the bare foot. In the booted foot the heel and toe marks are likely to be deeper than in the bare foot; and the harder and sharper edged the sole of the boot is, the clearer cut will the marks be. There are a great many kinds of boots, and the impression made by the different patterns vary, so that no hard and fast rules are possible; but more will be said about this later on.

72. On the bare-footed impression one can only distinguish the deeper portion from the shallower portion by a careful study of a large number of impressions on the ground, no amount of writing will ever make it clear. Opportunities for studying tracks on the roads should be sought.

73. As pointed out in paragraph 31 it is useless to compare measurements of feet with measurements of impressions of feet left on the ground because the sole is very liable to spread when pressure is brought on it. A camel's or elephant's foot, as it is being placed on the ground, appears to bulge outwards on the ground surface as soon as pressure is brought to bear on it. A human foot does the same thing in a smaller degree. Therefore never measure the sole of a man's foot when comparing it with an impression made on the ground. Get another impression made under circumstances as similar as possible to those obtaining when the first impression was made, and then compare the two impressions.

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CHAPTER VI.

ON BOOT TRACKS.

74. So far mention has only been made of bare feet, but booted feet have their characteristics also. To begin with there are innumerable kinds of boots and shoes. Among the European makes there are heavy walking boots, ammunition boots, light walking boots, tennis shoes, &c., and all these may differ in the size of heel, the number and position of nails, the shape of the toe and the size of boot. Among country made boots there are imitations of all these types, rope-soled boots and other patterns used by Europeans. Also all the very numerous patterns of native styles of foot gear. All these will leave distinctive impression. Boots again will show many differences in wear. Some will have new sharp edges, others will show rounded worn edges, others again may have holes or patches, or rubber pads, and many worn by natives have metal tips and bars.

75. Much can therefore be learned from the study of the booted track of a person who is wanted.

76. In hard soil little more than the impression of the heel and of the toe of a boot will be seen, the rest of the boot will hardly leave a mark.

77. When the impression of a boot which is believed to have been made by a criminal is found, it will generally pay to requisition the services of an intelligent shoe-maker ; in his profession he will in all probability have studied foot-wear, and will know far more about boots than the non-professional man and may perhaps be able to give valuable hints. For instance he may be able to say whether the boot has worn unevenly, and what peculiarity in walking has caused the particular unevenness, he may also be able to say in what part of the country that kind of boot is usually made, whether it is commonly worn or not in the locality, and what class of people usually buy such boots.

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CHAPTER VII.

CATTLE AND MISCELLANEOUS TRACKS.

78. The author has not had sufficient leisure to work out the subject-matter of this chapter in anything like the detail that its importance would seem to deserve; the few remarks it contains must be understood to be more in the direction of hints, to those who wish to take up the study of tracking in all its branches, than anything else.

79. Cattle are constantly stolen, and attempts are frequently made to track them; those unversed in the art of cattle tracking would find great difficulty in picking out the track of the stolen animal after it had got mixed up with other tracks; but with the help of a slate and careful observation it would not always be impossible.

80. Animals, like human beings, have individual characteristics when walking unconcernedly. Where cattle are concerned these are most noticeable in the length of stride, the positions in which the feet are planted in relation to each other, the splitting of the hoof and the shape of the two halves of the hoof.

81. In the vast majority of cases the left, or near, hind foot is placed on the ground close to the left, or near, fore foot, and the same applies to the right, or off, feet. If the tracks illustrated in Plate XV are studied, it will be seen in those of the goat that the hind foot on each occasion is a long way in front of the corresponding fore foot; that that of the bullock is also in front, but not sufficiently so to let the track of the fore be wholly seen; that the hind foot of the Sambar has a tendency to cover the fore, but not completely; that the hind foot of the leopard covers the fore perfectly (so much so that the author and 3 keen-eyed shikaris failed in this instance to find any trace whatsoever of the fore foot); that the three-year old buffalo bull-calf dropped its hind foot far behind its fore; and that the hyæna apparently (no opportunity for verification was obtained) planted its off hind just behind its near fore, and near hind close to its off fore.

82. These tracks are shown accurately to scale; they were originally sketched to scale on $\frac{1}{12}$ inch sectional paper, so that one inch is exactly equal to one foot.

83. No hard and fast rule can be laid down with regard to the planting of the feet; the author has seen a buffalo track in which the hind feet were almost as much in front of the fore, as those of the calf in the illustration were behind them; but this is most exceptional.

84. Sometimes the hind feet are placed more or less on the inner side of the fore, sometimes on the outer side. In the tracks of the bullock (Plate XV), for instance, the tendency is for the near hind to go inside the near fore, and for the off hind to go outside the off fore. In the buffalo and goat both hind feet were placed outside the fore.

85. Whatever action the animal has, is characteristic of it, and is unlikely to alter materially, a fact that helps us a good deal.

86. Sex has much influence on the shape of the hoofs. In ordinary cloven-footed domestic animals the male has a squarer toe than the female.

87. Age, again, has something to say to the spoor; after the animal is full-grown the splitting of the hoof helps us; generally speaking this is more noticeable in the hind than in the fore foot. In the older bovine animals and buffaloes the hind hoof generally opens out more at the toe than at the heel, and in immature animals the tendency is for the greater extent of split to be at the heel (*vide* Plate XVI).

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88. Then, and perhaps most important, the actual shape of the under surface of the two halves of the hoof vary much more in different animals than is usually suspected.

89. We have noticed therefore five points, every one of which may help a tracker to identify the spoor of an animal after it has been temporarily lost. The same principles (except in the case of the splitting of the hoof and the squareness of the toe) apply to the horse.

90. Every person who aspires to track lost cattle should study the spoor of all the various kinds of animals whose tracks are at all likely to interfere with his work; he will quickly learn what a great difference there is in such tracks. For instance let him but glance at the extraordinary dissimilarity between the goat and the chinkara (Plate XVII).

91. Police sometimes have to hold enquiries into the cases of persons killed by wild animals. The tracks of a tiger are unmistakable, but people, whom one would have expected to know better, have occasionally pointed out hyæna and wild dog tracks as those of a leopard; and so tracings of the tracks of these animals have been given in Plate XVIII. It is to be regretted that the tracks of a wolf have not come to hand.

92. The author was once amused by a policeman being puzzled to know in which direction a cart had gone, when the tracks of the bullocks which drew it were actually visible; when this aid is not available the difficulty is greatly increased; but usually, by walking slowly along the track and looking carefully until one sees a stone, a twig, bit of straw or other loose object displaced by a wheel, the difficulty is overcome, for such things are nearly always pushed forward to a noticeable extent; sometimes too the wheel will drop suddenly into a rut, or off a prominence into a hollow, when the dust will be thrown to one side (generally in a forward direction), whereas when the wheel mounts from below this does not happen; again in damp soil the wheel drags up the earth behind it and forms serrations, the shape of which show the direction.

93. To tell in which direction a bicycle has gone is frequently a matter of considerable difficulty. It is true, as Conan Doyle has pointed out, that the back wheel passes over the front wheel, but in the majority of cases this does not help in deciding the direction in which the bicycle has gone. If the bicycle is going fast over dust it will cause it to spurt to the side in a slightly forward direction, and the same may be said of slush in wet soil: again if it is a free-wheel going down-hill, or the rider is coasting, there will be a tendency for the back wheel to cover the front and for the bicycle to run straight, whereas up-hill the wheel will wobble from side to side, and the tracks made by them will cross and recross.

IMPERIAL RECORD DEPARTMENT
DEPARTMENT

CHAPTER VIII.

SOME HINTS FOR BEGINNERS IN PRACTICAL TRACK READING.

94. In tracking, at least as much as in other arts, practice only makes perfect, and those who essay to know anything must practise the art as well as read up the theory of it. It will be found, as pointed out by General Baden-Powell, an interesting occupation.

95. If the beginner has to do his tracking alone, his best chance will be to move carefully along, placing his feet just behind the track—taking care not to obliterate them—his right behind the impression of the right foot, and his left behind that of the left; when he is at fault he will know within a very short radius where to look for further indications. If the track goes over soil which shows nothing, he should mark the spot where the last track is visible, and then make a cast ahead on more favourable soil, taking first the place where he imagines the man would naturally have gone. If the track enters water, he should not conclude the criminal must have crossed at that spot, it is quite possible he went to water to deceive trackers, and has emerged again on the same side, or the opposite side higher up or lower down.

96. It is however always better to work in couples if possible; if the track is along a road which shows nothing because many people or cattle have gone over it or because it is stony, and the trackers have already been able to study the foot-print, then it is best for each to take one side of the road and walk along the very edge, the sides are often less used than the middle, and if the criminal has gone off the road, or moved to one side, one or other of the trackers will be able to spot the track.

97. In tracking the main difficulty is to recognize the track that is being followed under all circumstances, to recognize it in every form it assumes in the different kinds of soil. The best way to teach oneself is to keep on imagining what sort of track a man would leave on the ground one is looking at.

98. On hard ground with a gritty surface the impression is invisible if looked at from straight above, though it may be quite distinct if looked at obliquely from some distance. Sometimes one will only be able to tell it from the fact that little stones have been overturned; in such a case the soil from which the stone has been moved will look either *darker* or *lighter* according to circumstances—sometimes only very faintly so—than the rest, and the stone will have its darker or lighter side (that which has lain on the ground) exposed. Similarly wherever the foot has pressed on the soil, if it (the soil) is at all damp, the spot will show up darker or, in some soils, lighter. On rocky ground, unless it is covered by dust, the only chance is to look for small stones or other things that have been displaced, exposing to the eye the spots from which they have been removed. If the rock has lichen on it this will have been rubbed off or pressed down; if there is grass or weed growing in crevices of the rock, they may have been trodden down or bruised.

99. Soft deep dry sand or dust or other similar substance falls in all round the track and leaves it unformed and difficult to read accurately.

100. In grassy land when the ground is hard all one will see is the bruised and trampled down grass; this can be seen some distance ahead when looked at obliquely, but the individual tracks will be indistinct and one will not get clear impressions. In other kinds of soil the tracks will be easier to follow.

101. It must also be remembered that the criminal may have carried a stick or *lathi* and that he may have constantly brought this to the ground; if he did, the mark left behind by it should be carefully examined, it may show clear impressions of the ferule, of a split, or of some peculiarity, such as an iron nail at the end.

GSL

102. Another point to be carefully observed is the kind of weather that has supervened since the track was made, and what influence that weather is likely to have had on it.

103. Bare feet are, as has been already said, uncertain things to measure, as they are liable to spread, and this is specially so in greasy soil after rain. In deep dust again at first sight it will look as though the person is flat footed, for a *chab* will give an impression instead of a blank, careful scrutiny however will show the moulding of the instep clearly.

104. When studying a track an attempt should be made to calculate how old it is, for this common sense and careful analysis are required. Sometimes it will cover some other track, in that case if it can be ascertained when the earlier track was made the greatest age of the impression is known. For instance it may have covered the tracks of the cattle when driven home at dusk and it may have been seen the first thing in the morning, this will show definitely it was made during the dark hours. Again the person may have stepped on some weed or grass, freshly fallen berry or fresh cow-dung. An examination will generally give some indication; in a fresh impression the edges are clean cut, but a strong wind will soon blur the sharpness if the soil is light and loose. In damp soil under shade a track looks fresh for a long time. The soil in a fresh track in most kinds of earth looks darker than the surrounding ground, for the pressure brings the moisture to the surface. Certain insects and worms work along the surface only when it is dark, if such a creature has worked across a track it generally means it was made fairly early in the night. Of course if rain has fallen, or there has been a dust storm, the result is easily noticeable. Again if the person has been accompanied by bullock, pony, dog or other animal its droppings will help to fix the time.

105. Everything connected with tracking wants careful and close observation, and a man can only become expert if he has a bent that way and loses no opportunity of practice. In taking a walk opportunities should be seized of trying to read the meaning of tracks on the road. General Baden-Powell shows in his book on scouting how very interesting a walk can be made when a litle track reading is indulged in. Study need not be confined to human tracks, those of a horse or bullock are most instructive; the same remark applies to those of a cart or bicycle.

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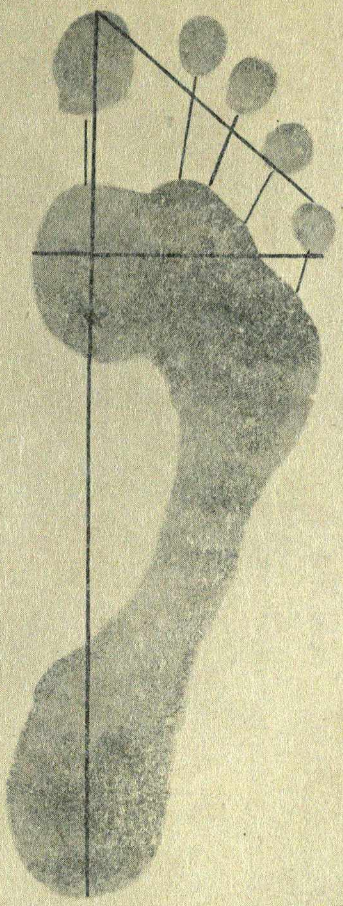
PLATE I.

TOES.

1. Long toes.
2. Short toes.
3. All three above line.
4. All three cut by line.

PLATE I.



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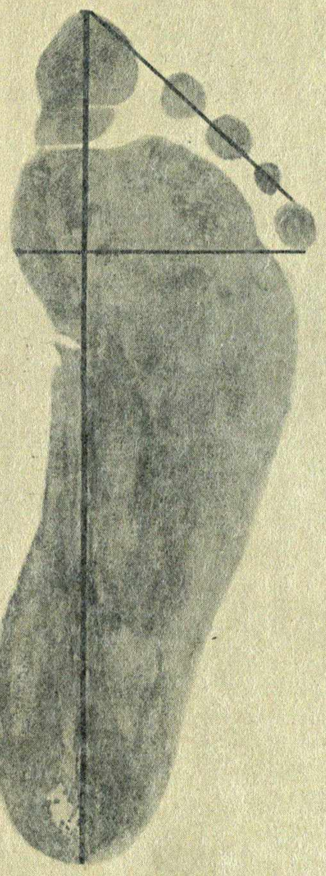

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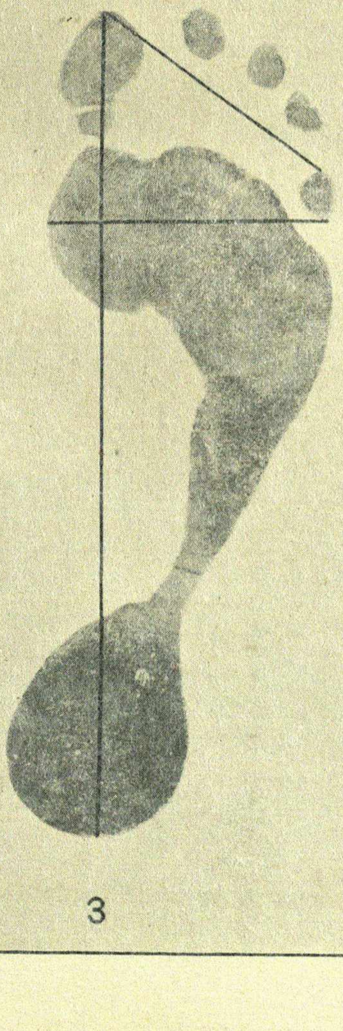

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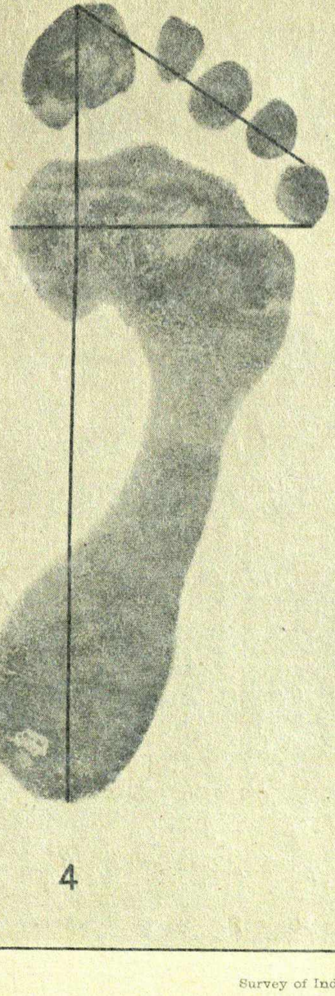

4

Half-tone.

Survey of India Offices, Calcutta, 1909.

PLATE II.

TOES.

1. Auguta longest.
2. Dusri longest.
3. Dusri furthest from line.
4. Tesri furthest from line.

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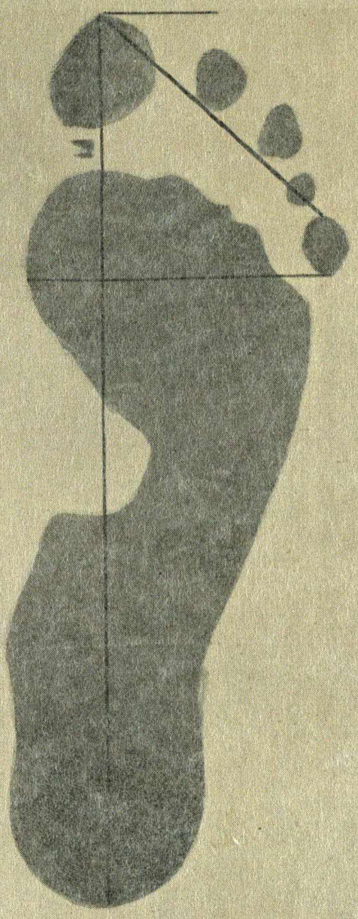
PLATE II.



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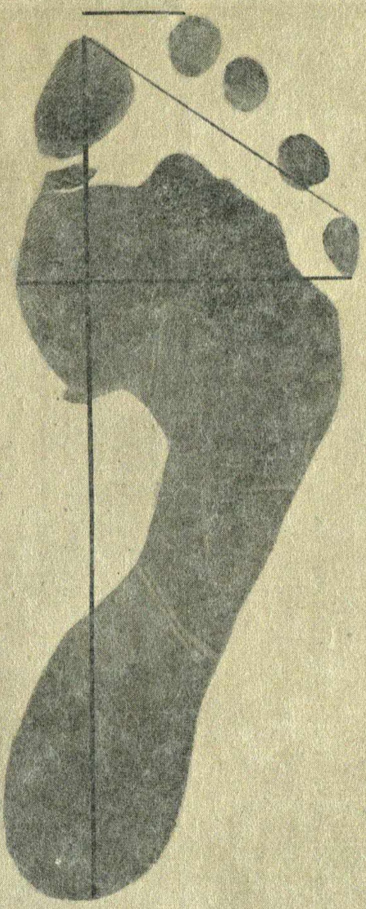

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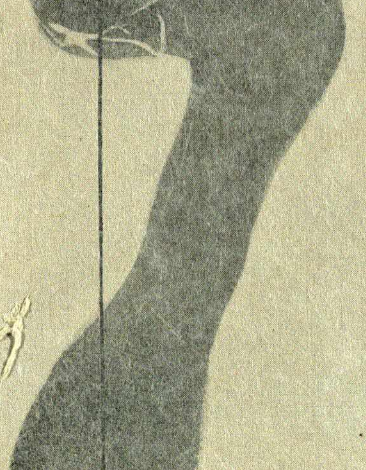

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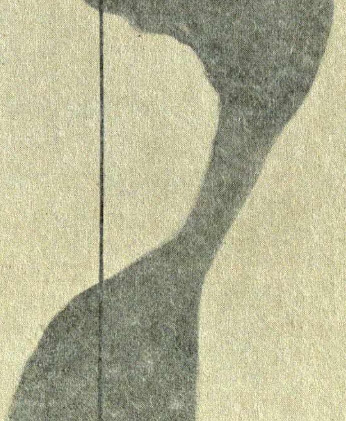

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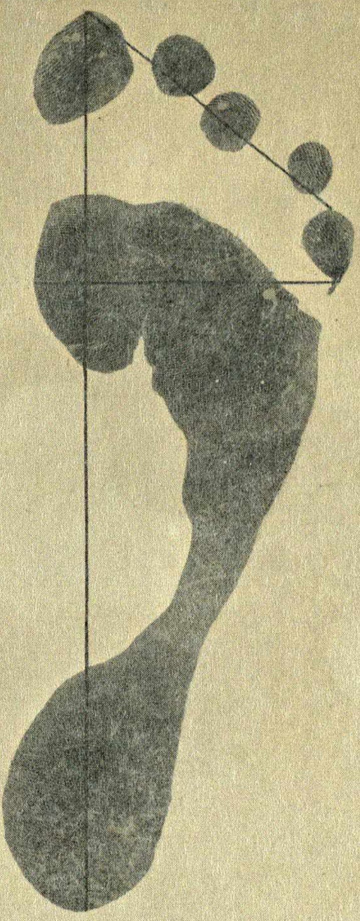
Half-tone.

Survey of India Offices, Calcutta, 1909.

PLATE III.

TOES.

1. Chothi highest on line.
2. Chichi proportionately long.
3. Anguta and Dusri adjacent.
4. Anguta and Dusri separated.



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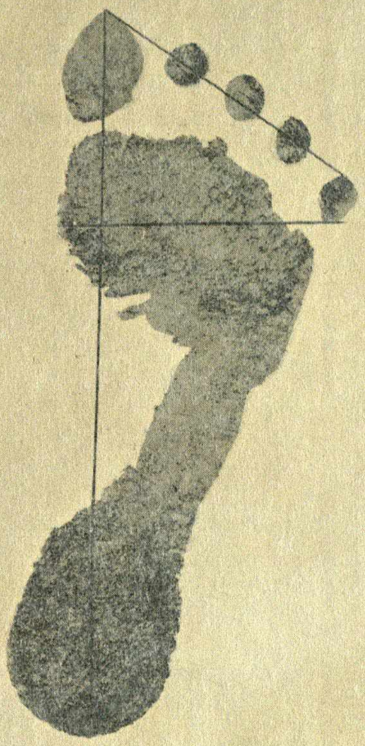

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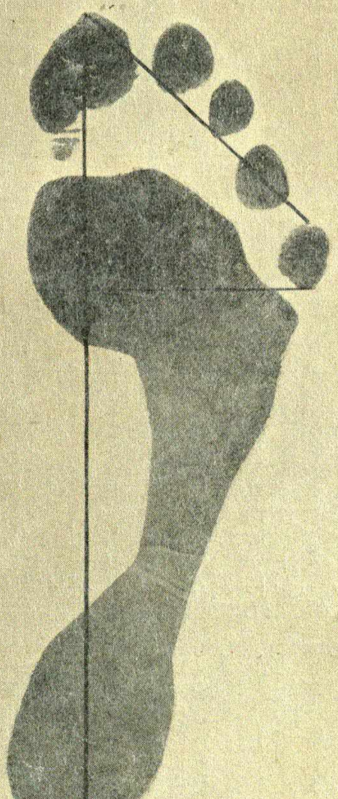

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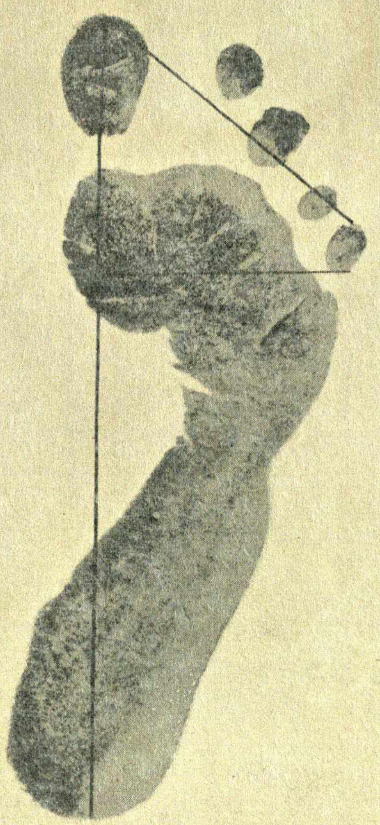

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Half-tone.

Survey of India Offices, Calcutta, 1909.

PLATE IV.

TOES.

1. Dusri and Tesri close.
2. Dusri and Tesri separated.
3. Tesri and Chothi close.
4. Tesri and Chothi separated.

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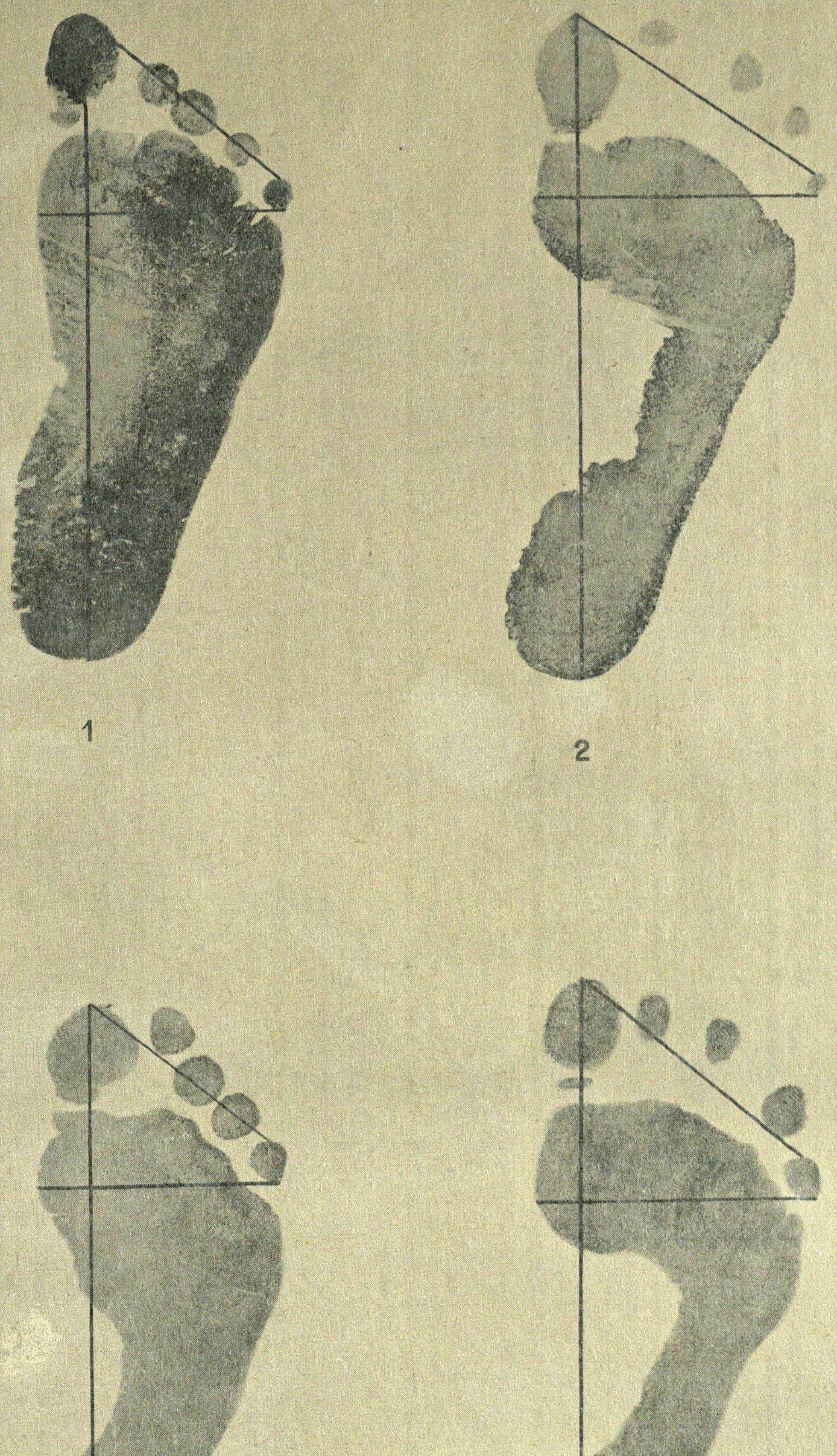
PLATE IV.



Half-tone.

Survey of India Offices, Calcutta, 1909.

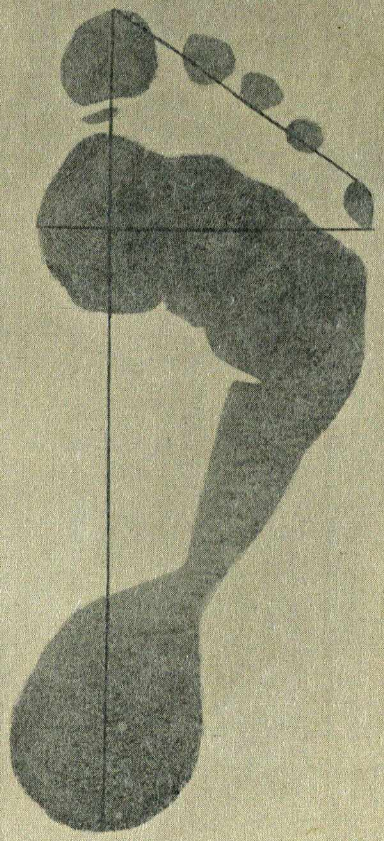
PLATE V.

TOES.

1. Chothi and Chichi separated.
2. Chothi and Chichi close.
3. Dusri missing (a X had been made where the impression should have been and had to be cut out).
4. Tesri deformed.

PLATE V.

CSL



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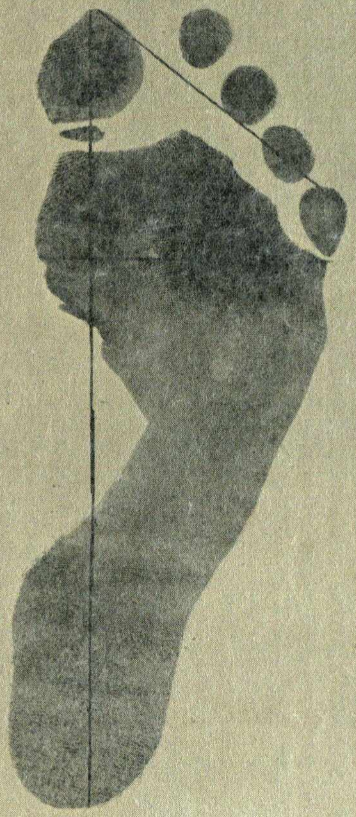

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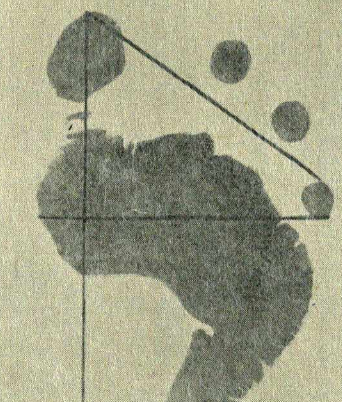

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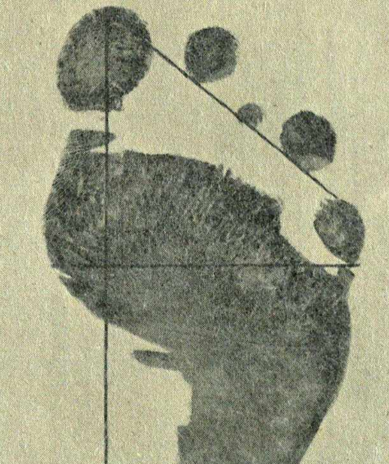

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Half-tone. Survey of India Offices, Calcutta, 1909

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PLATE VI.

TOES (ABNORMAL).

1. Chothi deformed.
2. Chichi not visible.
3. Chichi turned over on its axis so that the plane of the nail is vertical.
4. Anguta projecting inwards, so that the axis lies inside the pab.

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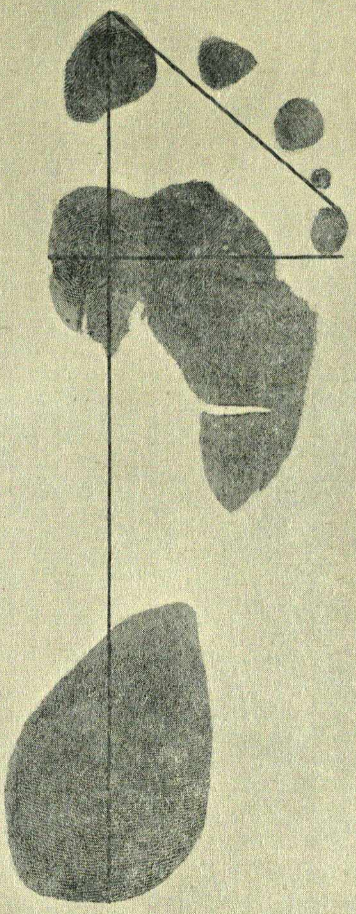
PLATE VI.



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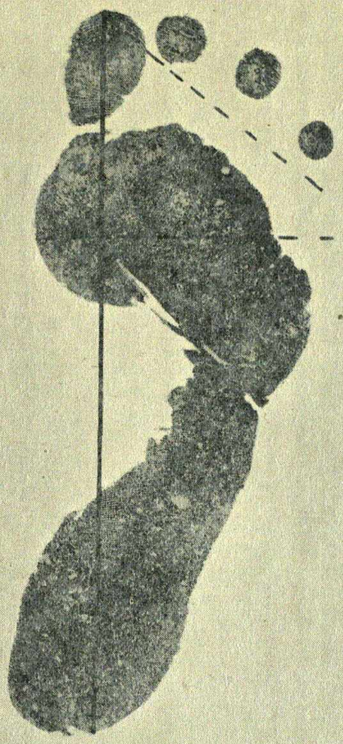

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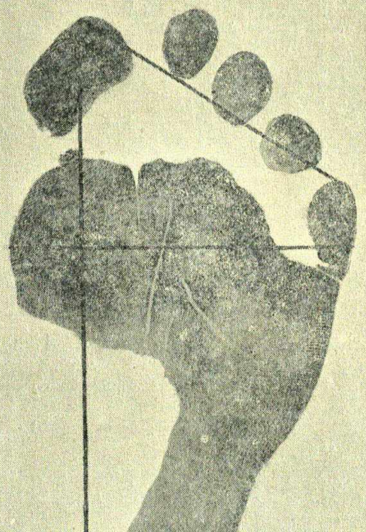

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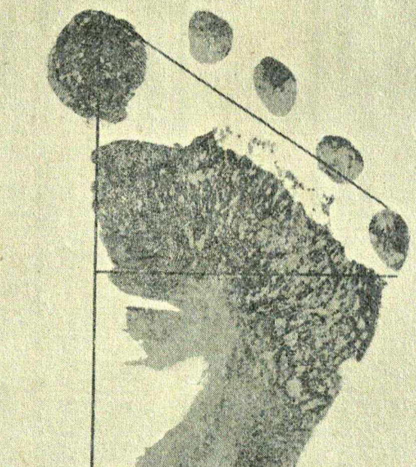

4

Half tone.

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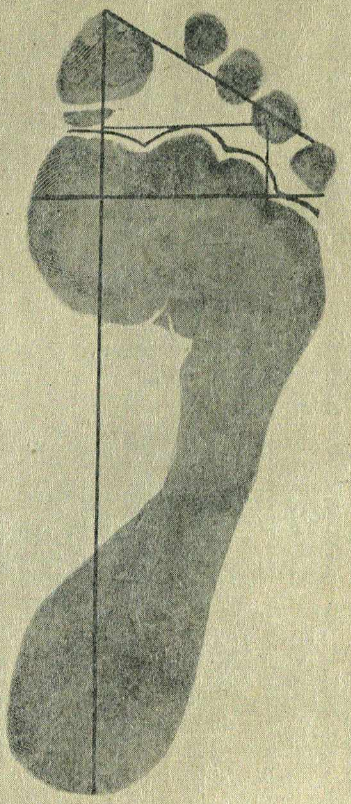
PLATE VII.

ZANGERI.

1. Four convex prominences.
2. Four concave depressions.
3. Gradual slope from *Bari* to *Choti Assi* which it meets just below perpendicular.
4. Sharp slope from Dusri to far below perpendicular.

CSL



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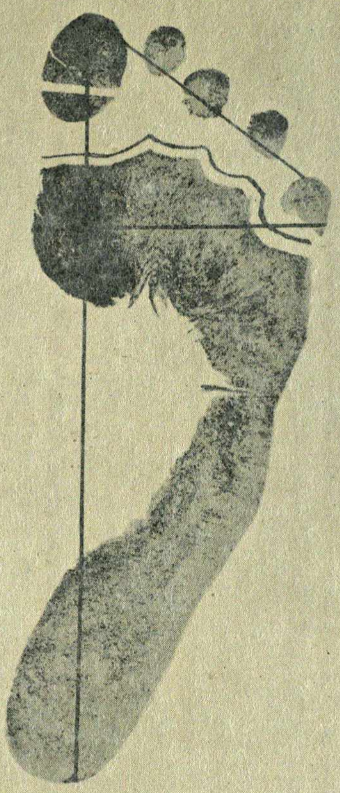

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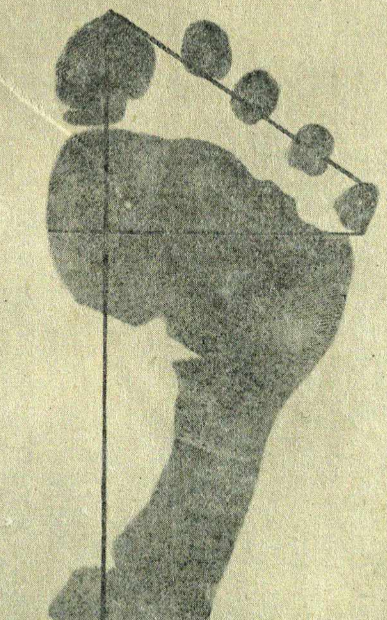

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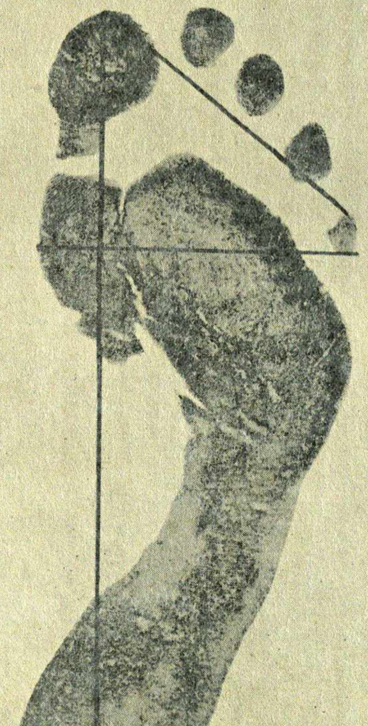

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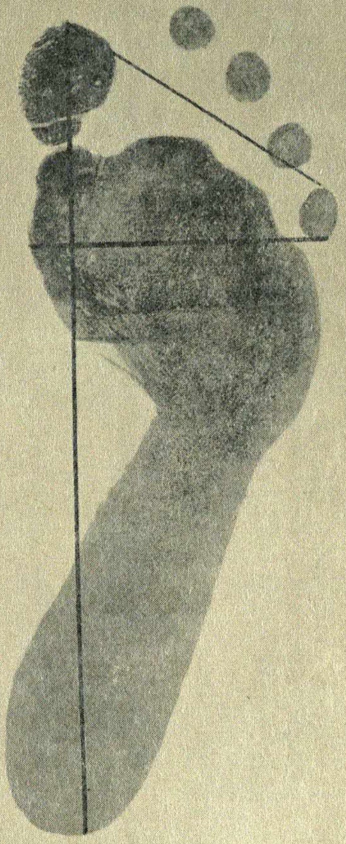
PLATE VIII.

CHOTI ASSI.

1. Straight below, bulged above.
2. Straight above, bulged below.
3. Nearly straight.
4. Three marked bulges

CSL

PLATE VIII.



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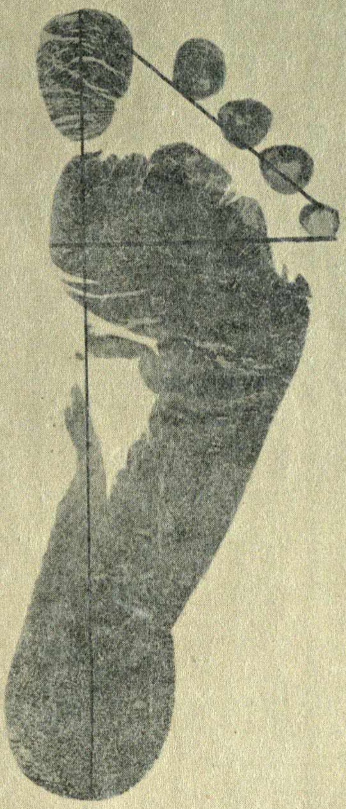

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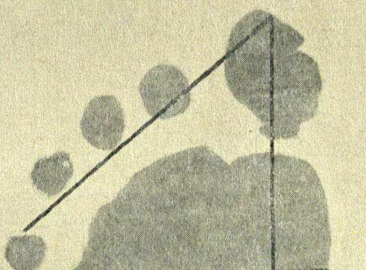

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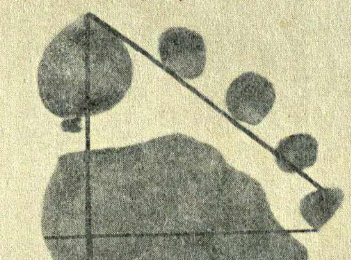

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PLATE IX.

CHOṬI ASSI.

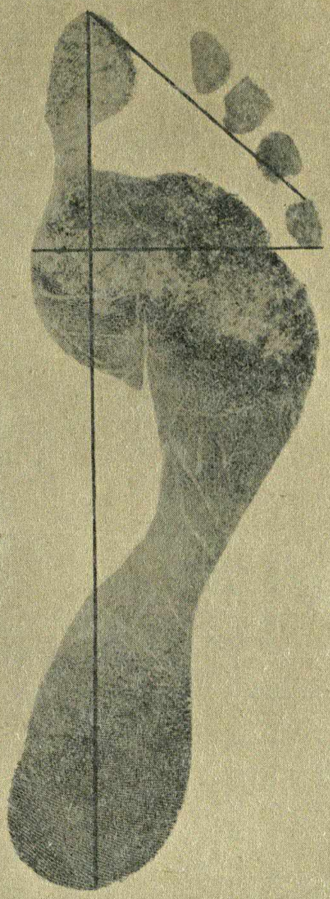
1. Concavity in region of *Talli*.
2. Convexity in region of *Talli*.

TALLI.

3. Very broad.
4. Non-existent.

CSL

PLATE LX



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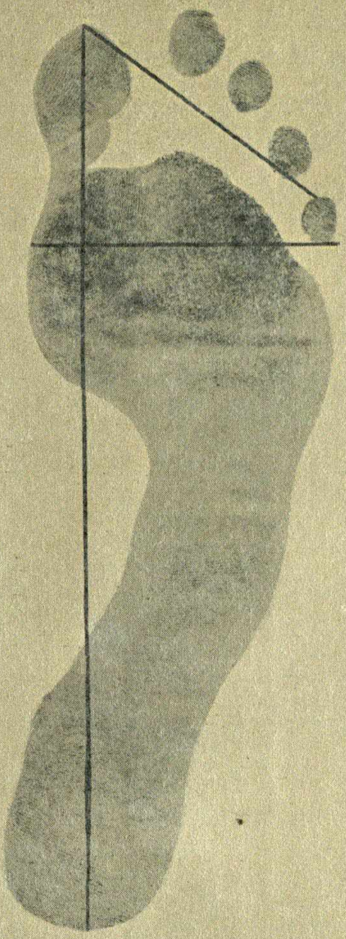

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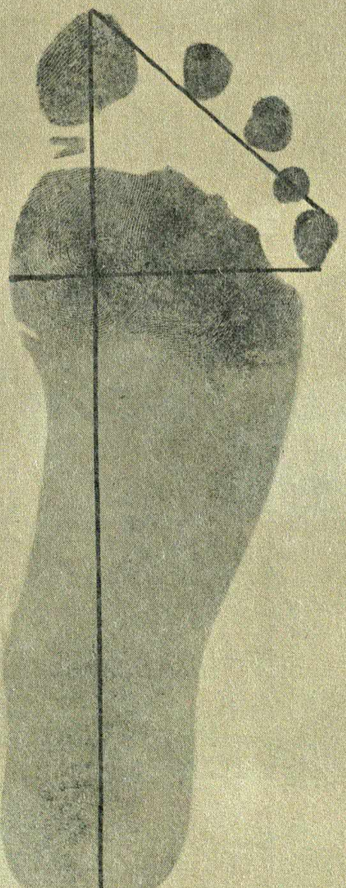

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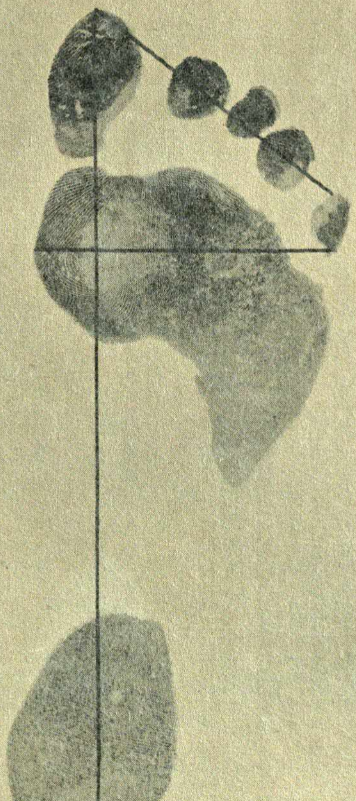

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Half-tone

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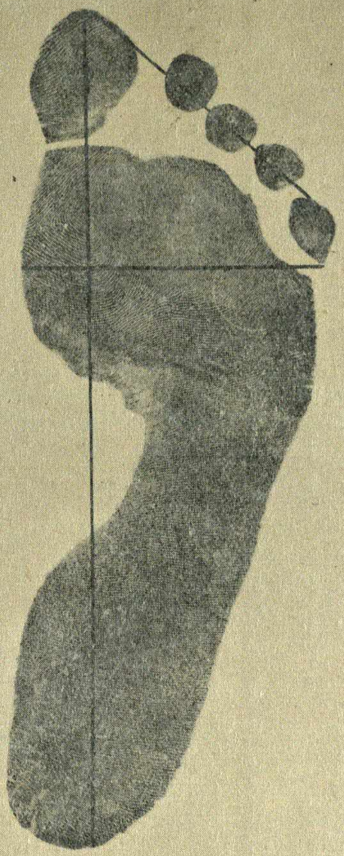
PLATE X.

TALLI.

1. Short and broad.
2. Long and narrow.
3. Long, broad and nearly parallel to axis.
4. Narrow and at considerable angle to axis.

CSL



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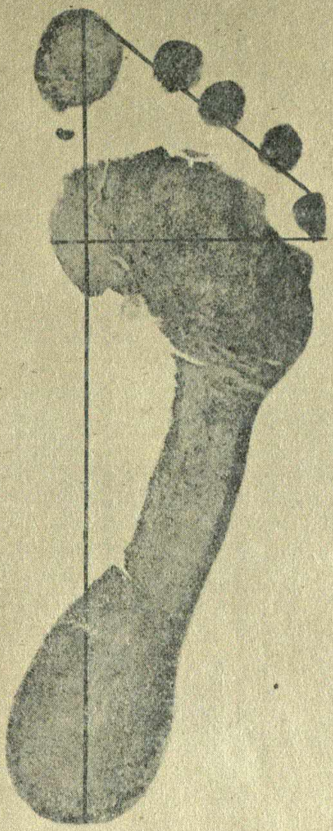

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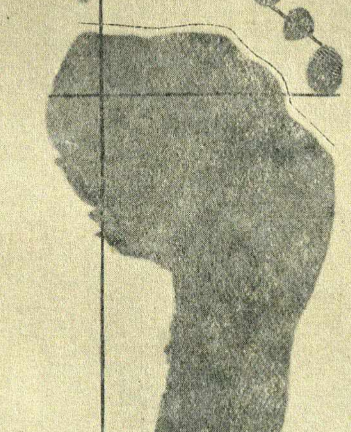

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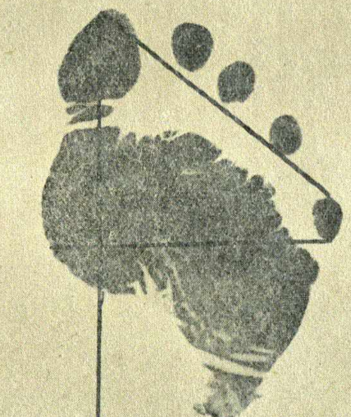

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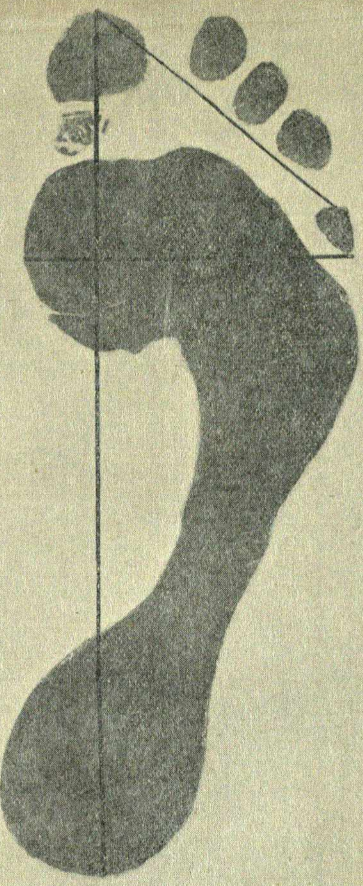
PLATE XI.

CHAB.

1. Long.
2. Short.
3. Hardly existent.
4. Non-existent.

CSL

PLATE XI.



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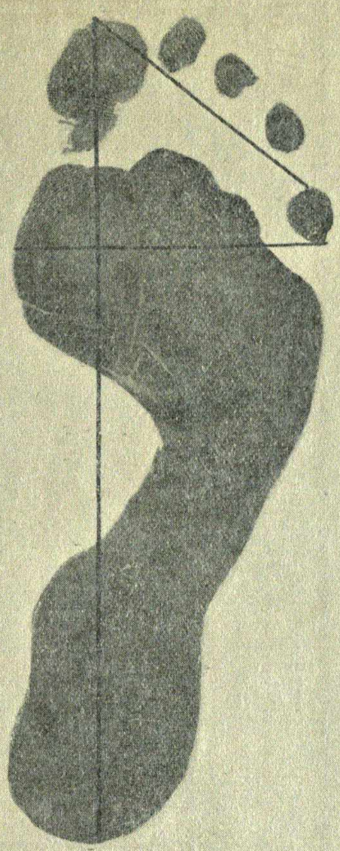

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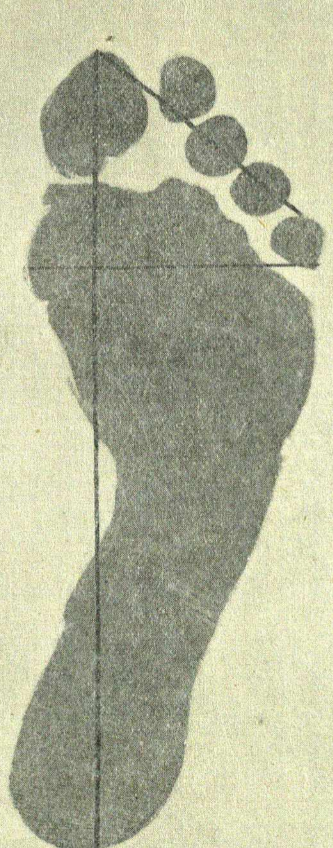

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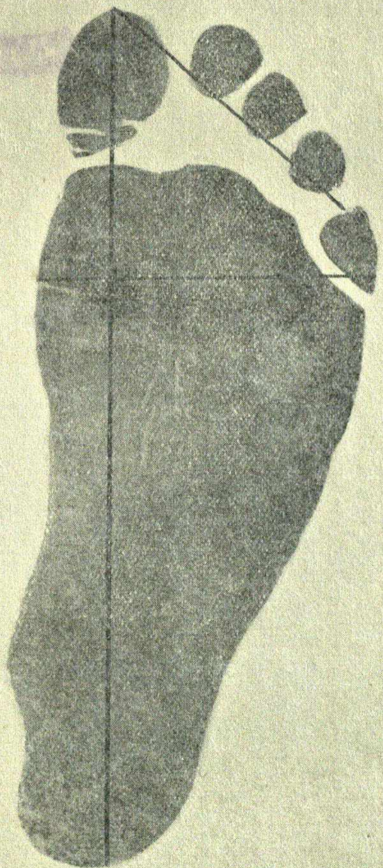

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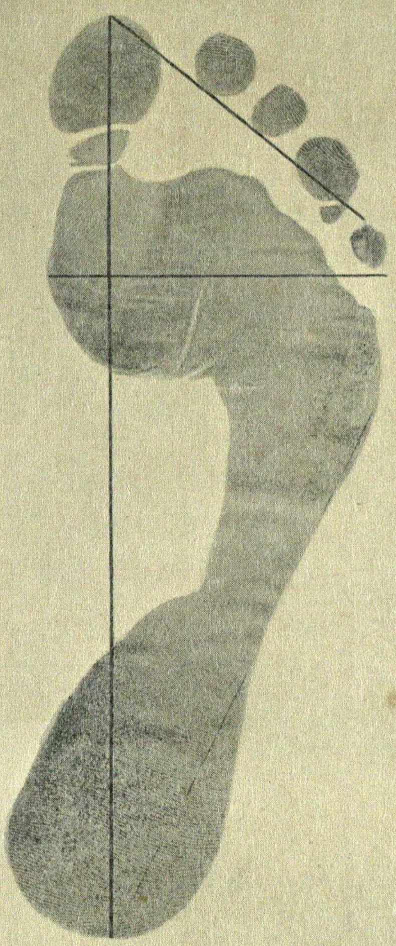
PLATE XII.

ERI.

1. Oval heel.
2. Globular heel.
3. Straight heel.
4. Slanting heel.

CSL



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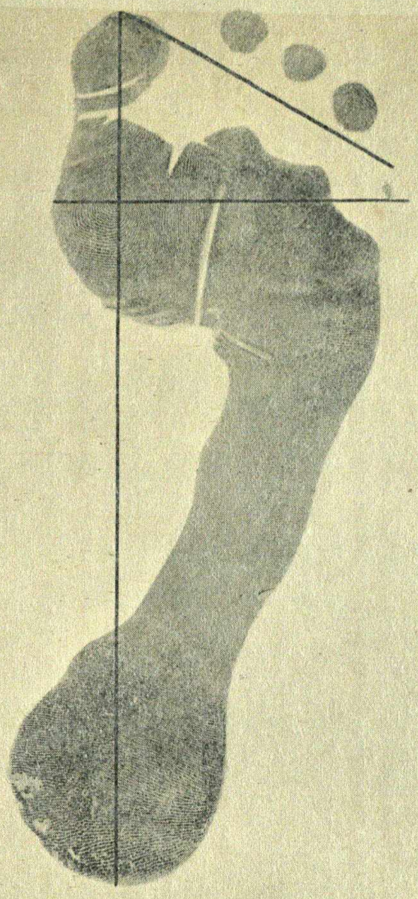

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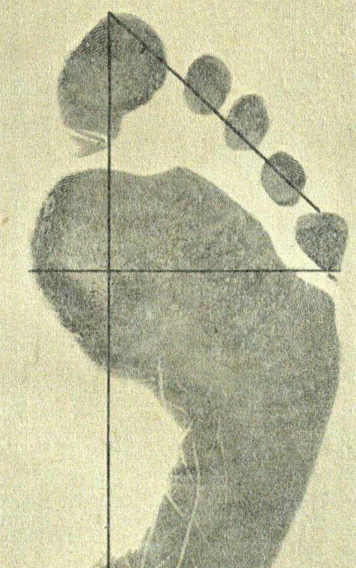

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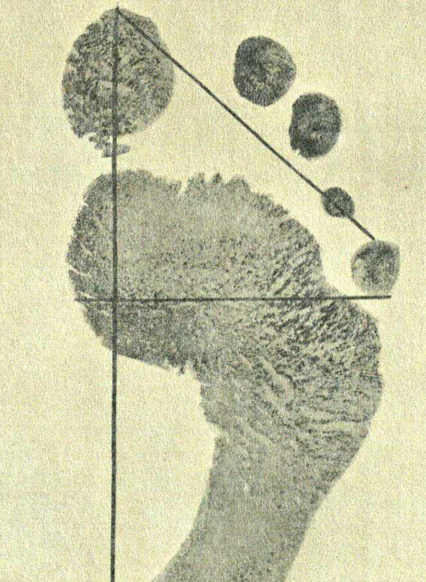

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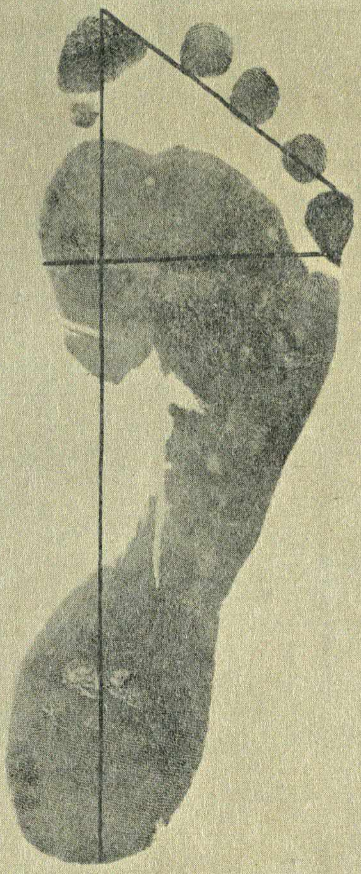
PLATE XIII.

ERI.

1. Long heel.
2. Short heel.
3. Distinct heel.
4. Indistinct heel.

PLATE XIII.



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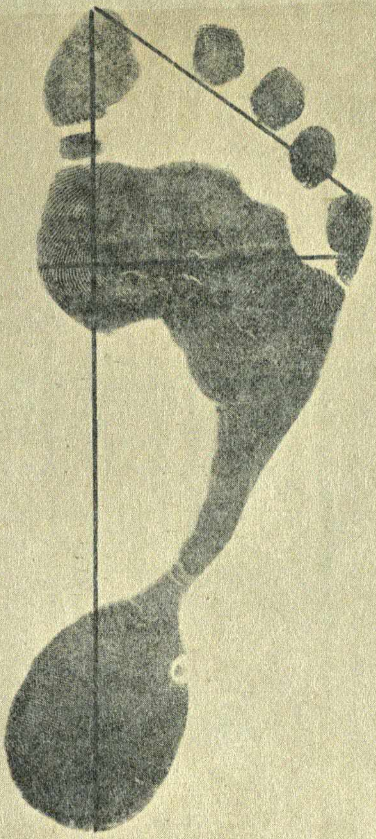

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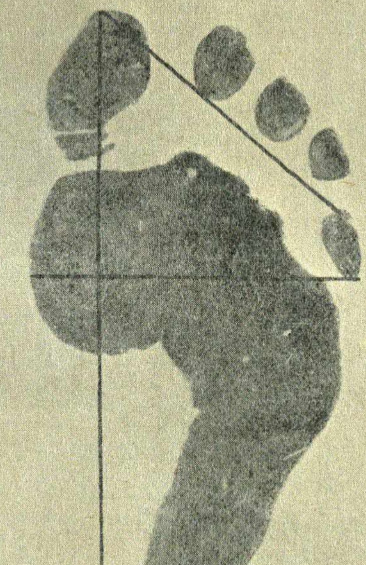

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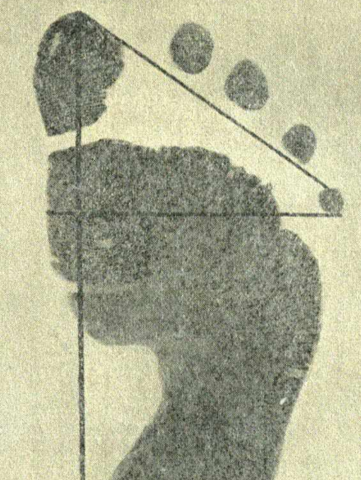

4

Half-tone.

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PLATE XIV.

BARI ASSI.

1. Deep angular *pab* and sinuous underline.
2. Shallow protruding *pab* and medium *chab*.
3. Deep circular *pab* and nearly straight underline.
4. Shallow receding *pab* and long *chab*.

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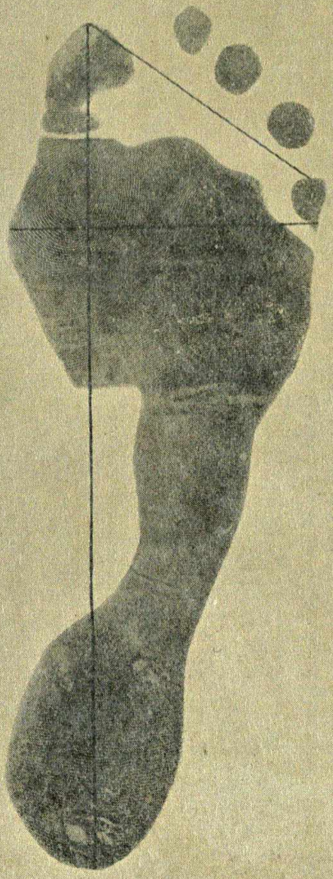
PLATE XIV



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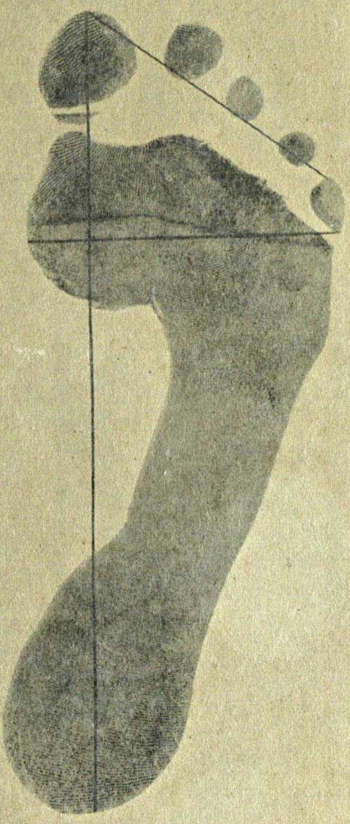

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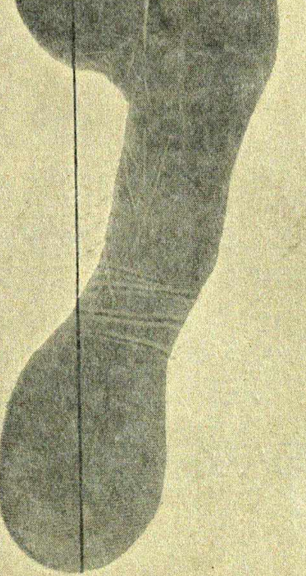

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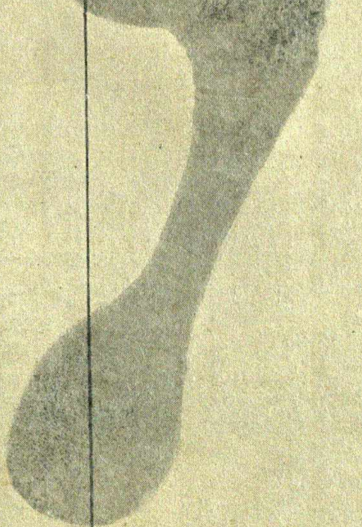

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PLATE XV.

ANIMAL TRACKS.

1. Bullock (6 years). Hind feet overlap fore.

2. Buffalo (3 years, male). Hind feet behind fore.

3. Sambar (stag). Hind feet cover fore.

4. Hyæna. Left hind behind right fore, and right hind behind left fore (correctness unverified).

5. Leopard (female). Hind completely cover fore.

6. Goat (1 year, male). Hind overlap fore very considerably.

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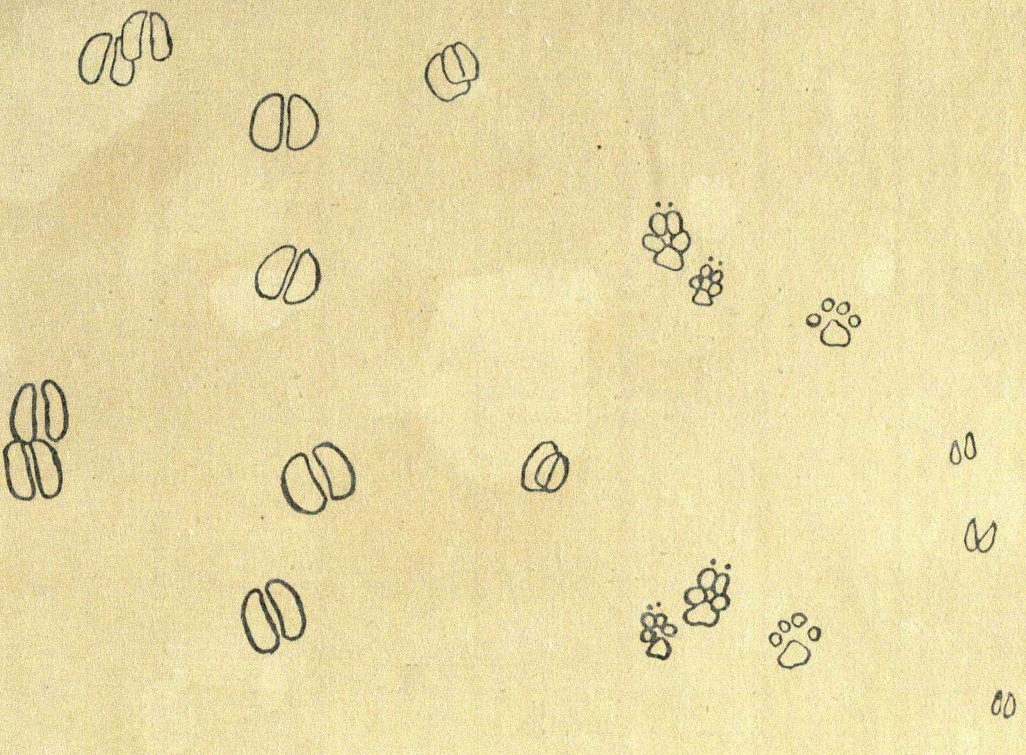
PLATE XV.



Line Block

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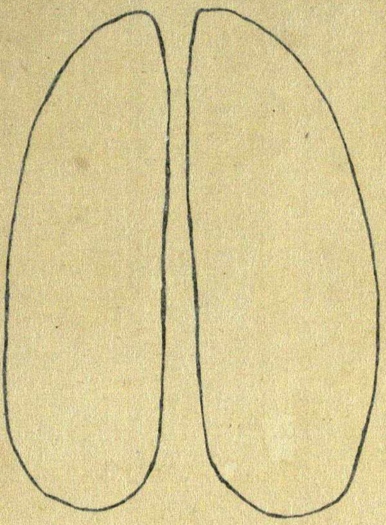
PLATE XVI.

CHARACTERISTICS OF AGE.

1. Bull calf (1 year), off hind.
2. Bullock (4 years), near hind.
3. Bullock (7 years), near hind.
4. Buffalo (cow, 15 years), near hind.
5. Cow (8 years), off hind.
6. Bullock (15 years), off hind.



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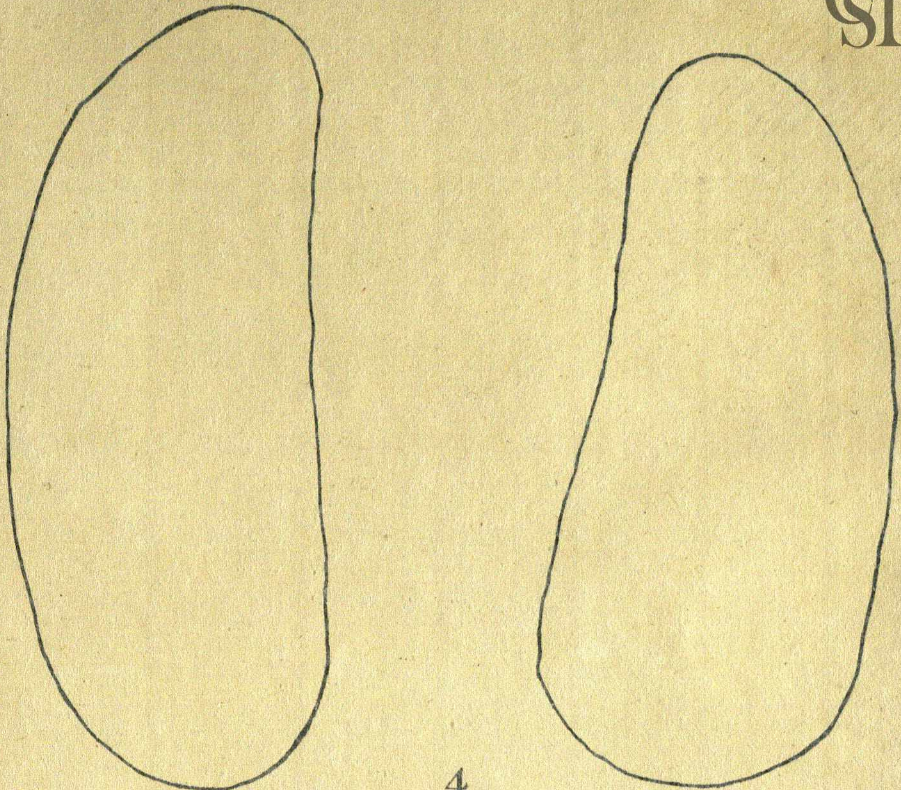

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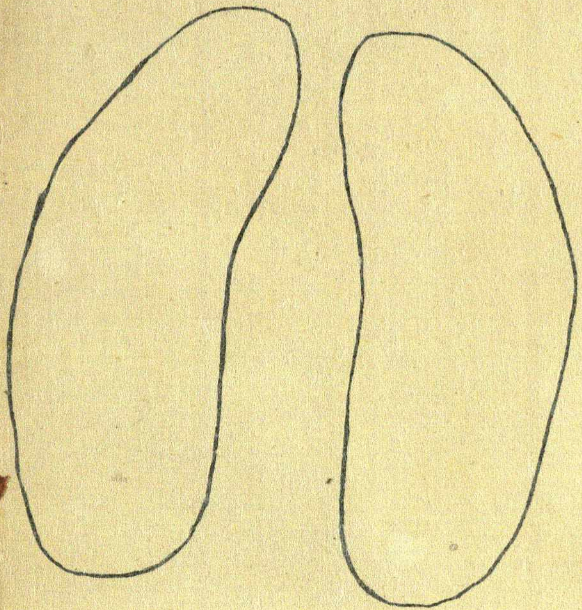

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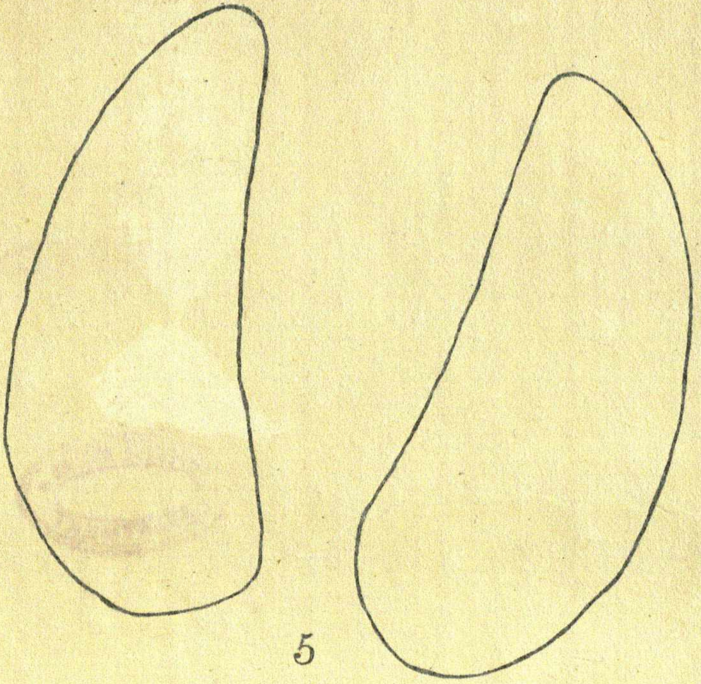

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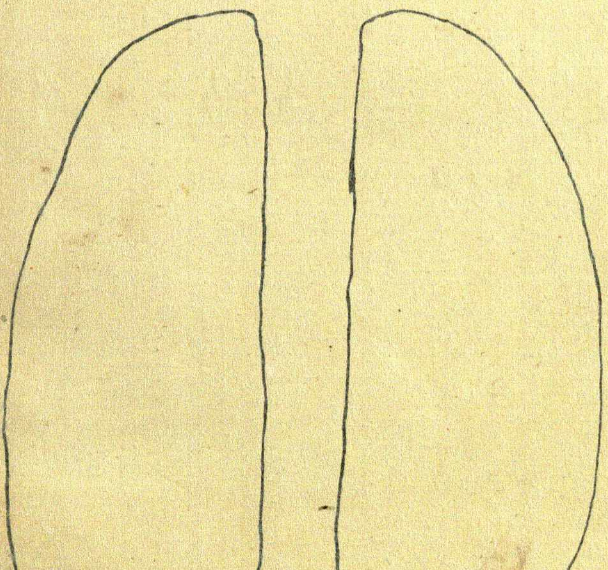

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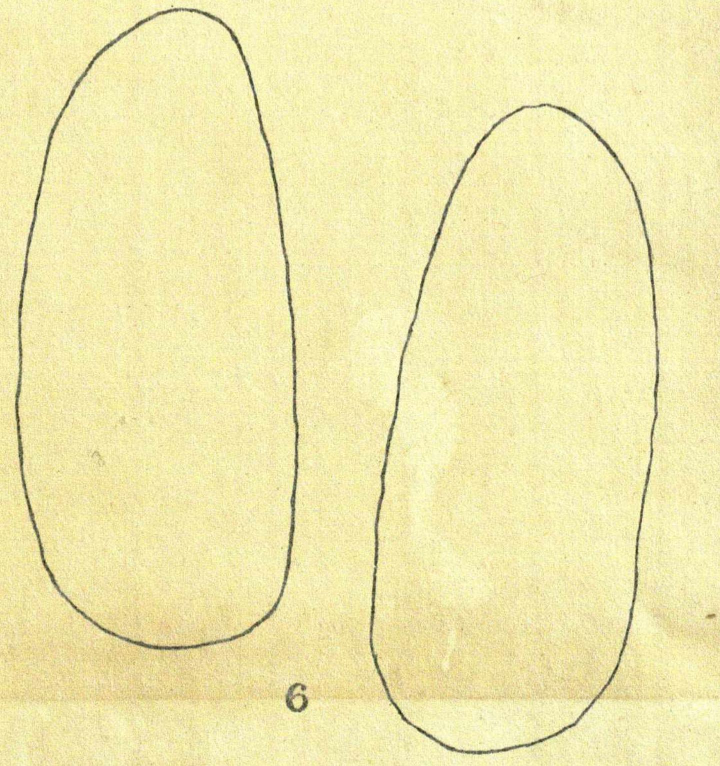

6

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PLATE XVII.

1. Goat (buck 1 year).

2. Chinkara (the split ought to have shown up to the toe, but was not apparent in the impression).

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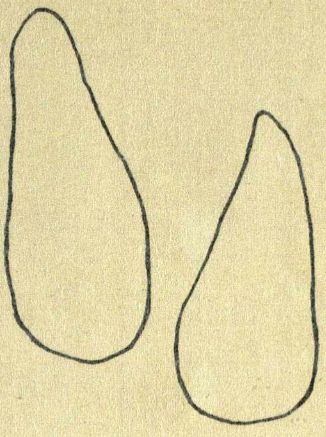
PLATE XVII



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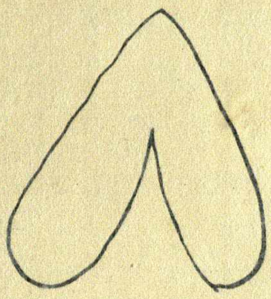

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PLATE XVIII.

1. Hyæna, left fore.
2. Hyæna, left hind ? (foot placed near off fore).
3. Wild dog, left fore.
4. Wild dog, left hind.
5. Leopard, right hind (female shot just after taking impression.)

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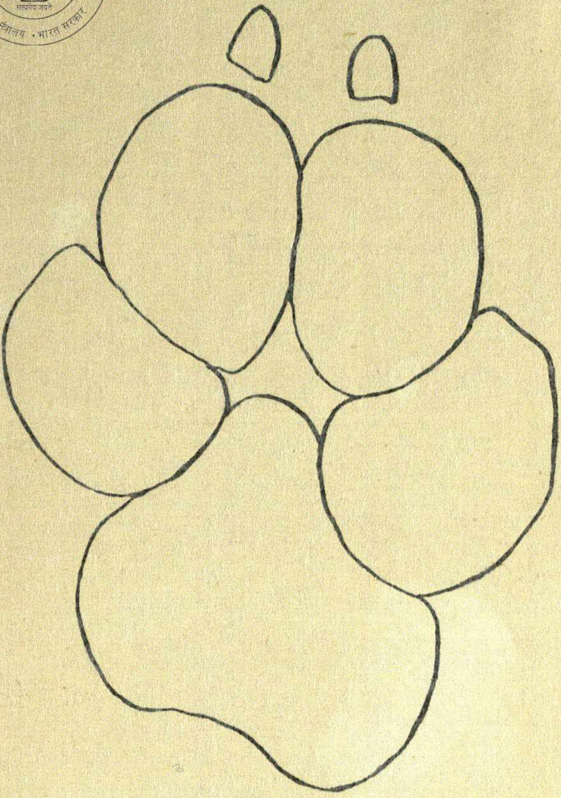

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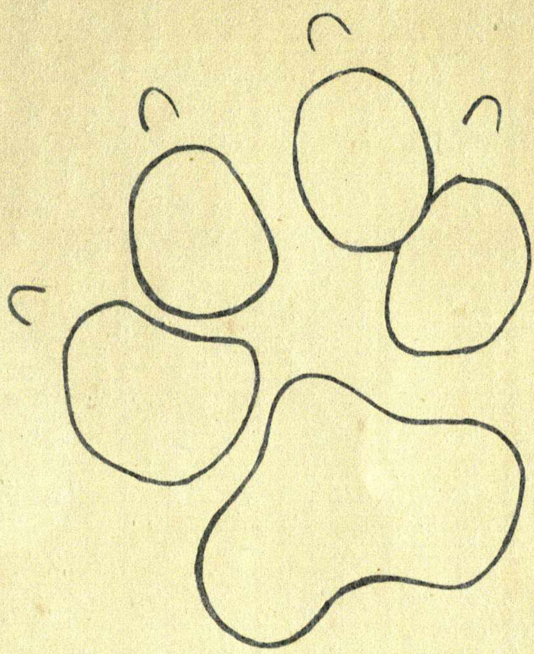

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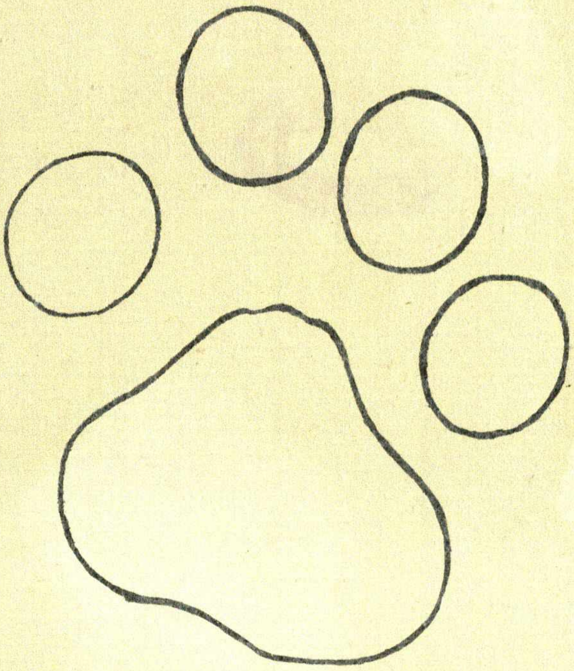

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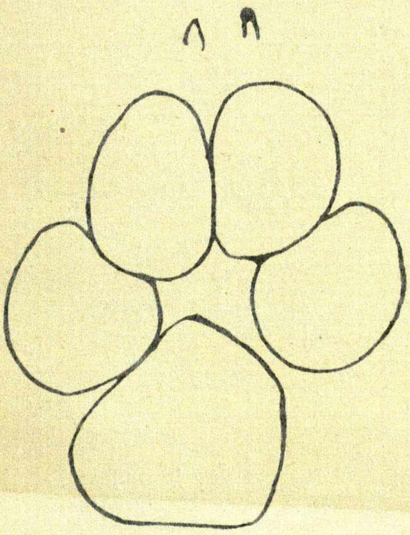

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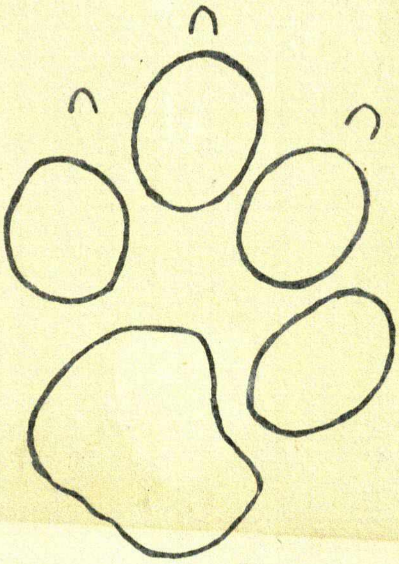

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INDEX.

Paragraphs.

A

Age, effect on walk and stride 45, 63, 65
—— influences amount of split in hoofs of animals ... 87
—— of track 104
Angle of foot, to line of march seldom changes 48
Animal tracks, difference in 80, 89
———— position of feet in 81, 83, 84
Anklets, effect on walk 45, 52
Axis, of foot 13

B

Backwards, walking 66
Bari assi, inner edge of foot 9, 10
Base lines, use of 13
Bicycle, tracks of 93
Boots, tracks of 71, 74, 75, 76, 77
Brushing ground with foot, causes of 65
Burdens, effect of, on walk 45, 59

C

Carts, tracks of 92
Cattle tracks, difficulty in picking up lost 79
Central line of march 43, 48
Chab, arch of instep 9, 10
Characteristics of foot (see features) ... ...
Chichi, little toe, pad of 8, 10
——— perpendicular on lowest edge of 13
Chothi, pad of 4th toe 8, 10
Choti assi, outer edge of foot 9, 10
Comparison of impressions 30
Cracks, in foot 12, 26
Creases, in foot 12, 26
Criminals, how to decide which tracks are those of... ... 16, 17, 18
——— may have had stick or lathi 101
——— tracked down in parts of India 2

D

Detection, first object in tracking is 29
Difference between leopard, hyæna and wild dog tracks ... 91
——— in animal tracks 80, 89
Difficulty, in picking up lost cattle tracks 79
——— main—in tracking to recognize tracks wanted ... 97
Disguishing tracks 66, 67
Drunkenness, effect on walk 46, 47
Dusri, pad of second toe 8, 10

E

Eri, heel 9, 10

F

Fast walking 45, 58
Fatigue, effect on walk 46, 47, 65
Fatness, effect on walk 45
Features of foot 7, 8, 9, 10, 11, 12, 14, 15
——— use of base line in recording 13
Feet, of animals vary in shape 88
—— position of, in animal tracks 81, 83, 84
Foot, features of (see features of foot) more easily distinguished by aid of lines 13, 14
—— impression, comparison of 30
——— ——— how to make record of 22, 23, 26, 27
——— ——— of same person liable to vary 30
——— ——— necessity for record of 20
——— ——— practical results observable in 40
——— ——— slate for recording 21
—— individuality of every 11
—— measurement of, unsatisfactory 31, 73, 103
—— pad of 8

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Paragraphs.

G

Goat, track of 90
Guru, Khoji's teacher 6
Guta, pad of hallux 8, 10

H

Height, effects on stride 62
Hyæna tracks, difference between leopard's and 91

I

Incomplete impressions, often useless for tracing 19
Individuality of feet 11
Injured, if criminal be, blood may show on track 17
Injury, effect on walk 49, 61, 65

J

K

Khoji 2, 4
—— his teacher, guru 6
Knock-kneed persons, walk of 51

L

Lathi, criminal may have had 101
Legal proof, tracking may furnish 29
Length of stride, for each leg sometimes differs 60
———— increased when walking fast 58
Leopard's track, difference between hyæna's and 91
Limp, causes difference in length of stride 77, 81
Line of march 43, 48
Loitering, effect on walk 46

M

March, line of 43, 48
Measurements of feet, unsatisfactory 31, 73, 103
Movements in walking ... ... 34 to 41

N

O

Obliteration, of traces before arrival of police can be legislated against ... 32
Obstacles, affect stride 64
Ornaments, on toes affect manner of placing toes on ground ... 53

P

Pab, pad under metatarso-phalangeal joint 8, 10
Pad, of foot 8
Pagis, Gujarati trackers 4
Paint, how to paint a tracing of an impression 23
Perpendicular on base line 13
Police, suggested police trackers 28
Position of feet in animal tracks 81, 83, 84
Practice, in tracking essential 94
Pregnancy, effect on walk 45, 94
Print, of foot how taken 15

Q

CSL

R

Paragraphs.

Reading tracks ... ... Chapter VIII
Record, of foot impression, how to make 22, 23, 26, 27
———————necessity for 20
———slate for taking 21
Running 50, 51, 52
Rustic, walk of 49

S

Scars, in feet 12
Sectional paper, advantage if impression shown on 14
——————impression should be pasted on 27
Sex, influences shape of feet of cattle 86
Shape of feet of cattle influenced by sex 86
——————animals varies 88
Sickness, effect on walk of 45, 46, 47
Slate, for taking records 21
Split of hoofs, influenced by age 87
Stick, criminal may have had a——— 101
Straightness in walking, sometimes due to hurry 48
——————sometimes due to honesty of purpose ... 49
Stride, difference in, may be due to wound 61
———length of 60
——————affected by age 63
——————————height 62
——————————obstacles 64
——————————pace 48

T

Talli, bridge of foot 9, 10
Tesri, pad of third toe 8, 10
Tiptoe, walking on 55
Toe ornaments, affect the method of placing toes 53
Toes turned in 50
Tracing paper, impressions to be traced on from slate ... 27
Trackers, education of 5
——— professional 2, 4
——— should study tracks of various animals 88
——— suggested police trackers 28
Tracking, best way to teach oneself 97
——— first object of, is detection, but may supply legal proof ... 29
——— in couples ... 96
——— main difficulty to recognize tracks wanted ... 97
——— practical hints ... ... Chapter VIII.
——— when alone 95
Tracks, age of 104
——— disguising 66, 67
——— entering water 95
——— how to decide which are the criminals 16, 17, 18
——— of bicycles 93
——— of boots 71, 74, 75, 76, 77
——— of carts 92
——— on damp soil 98
——— on grass 100
——— on hard soil 98
——— on rocky soil 98
——— on soft deep dust 99, 103

U

V

Variation of shape of feet in animals 88
Village police authorities, their aid necessary 32

W

Walk, effect of age on 45, 63, 65
——— anklets on 45, 52

CSL

W

Paragraphs.

Walk, effect of burden on ... 45, 59
———— diseased brain on ... 46, 47, 65
———— drunkenness on ... 46, 47
———— fatigue on ... 46, 65
———— injury on ... 46, 47, 49, 61, 65
———— limp on ... 61
———— loitering on ... 46
———— obesity on (also pregnancy) ... 45, 54
———— paralysis on ... 47, 65
———— sickness on ... 45, 46, 47, 65
———— weekness on (also giddiness) ... 47
Walk of, knock-kneed person ... 51
————ordinary person in sound health ... 44, 47
————rustic ... 49
Walking, backwards ... 66
———— down hill ... 57
————fast or energetically ... 44, 58
———— motions during ... 34, 35, 36, 37, 38, 39, 40, 41
———— on tiptoe ... 55
———— slowly ... 45
———— up-hill ... 56
———— with straight feet ... 48, 49
———— with toes turned out ... 34
Water, tracks entering ... 95
Weather, to be taken into account in reading tracks ... 102
Wild dog tracks compared with leopard and hyæna ... 91

X

Y

Z

Zanjeri, outline of front of pab ... 8, 10

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4433

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